

حمل الآن

مجاناً وحصرياً

امتحانات رقم (1)

الترم الاول



1- Choose the correct answer:

9

- a If $X = \{6\}$, then $n(X^2) = \dots\dots\dots$ ($\emptyset$, 0, 1, 2)
- b The vertex of the curve that represents the function $f(x) = x^2 - 4x + 5$ is $\dots\dots\dots$
(3, 1), (2, 4), (1, 5), (2, 1)
- c If $a > 5$, then the point (5, $a - 5$) lies in the $\dots\dots\dots$ quadrant.
(1st, 2nd, 3rd, 4th)
- d The difference between the greatest and smallest value is called $\dots\dots\dots$
(range, median, mode, standard deviation)
- e If $n(X) = 6$, $n(X \times Y) = 18$, then $n(Y) = \dots\dots\dots$ (3, 6, 18, 36)
- f If $3^{(x+7)} = 1$, then $x = \dots\dots\dots$ (-1, 7, -7, 1)
- g If $g(x) = x^2 + 1$, $x \in [-4, 2]$, then $g(x) \in \dots\dots\dots$
([1, 17], [1, 4], [0, 16], [5, 20])
- h If 7, x and $\frac{1}{y}$ are in the continued proportion, then $x^2 y = \dots\dots\dots$
(7, 14, 49, $\frac{1}{7}$)
- i The linear function defined by the rule $y = 2x - 1$ is represented by a straight line intersecting the y-axis at the point = $\dots\dots\dots$ ((0, 1), (0, -1), (1, 0), (-1, 0))

2- Answer each of the following:

21

- a Find the number that if it is added to each of the numbers 3, 5, 8 and 12, they become proportional

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- b** If $(x^3 - 1, 4) = (7, y)$, find the value of : $4y + x$

- c** If $\frac{x}{y} = \frac{2}{5}$, find the value of $\frac{3x - y}{2y - 3x}$,

- d** Calculate the mean and the standard deviation for the following frequency distribution:

Sets	0–	4–	8–	12–	16 – 20	Total
Frequency	3	4	7	2	9	25

- e** If $y \propto x$ and $y = 6$, at $x = 12$, find:

1) The relation between y and x

2) The value of y at $x = 14$

- f** If $X = \{4, 6, 8\}$, $Y = \{1, 2, 3, 4, 5\}$ and R is a relation from X to Y where " $a R b$ " means " $a = 2b$ " for each $a \in X, b \in Y$.

1) Write R and represent it by an arrow diagram.

2) Show that R is a function or not and find its range.

- g Two integers, the ratio between them is $1 : 2$ and if we subtracted 5 from each term, the ratio between them becomes $1 : 3$, **find the two numbers.**

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1- Choose the correct answer:

- a If all individuals are equal, then ($x = 0$, mode = 0 , $\bar{x} = 0$, $\sigma = 0$)
- b The vertex of the curve that represents the function $f(x) = 2x^2 - 4x + 5$ is
((1,3) , (3, 1) , (2, 4) , (1,5))
- c The set of images of each element of the domain of the function is called the.....
(domain , codomain , rule , range)
- d The mean of the values 10 , 4 , 5 , 6 , 5 is (10 , 6 , 12 , 5)
- e The function f where $f(x) = x^4 - 2x^3 + 7$ is a polynomial function of the degree.
(first , second , third , fourth)
- f The middle proportional between a and c is ($\sqrt{(a+c)}$, $\frac{a+c}{2}$, $\pm\sqrt{ac}$, ac)
- g $2^{25} = 2^{24} + \dots\dots\dots$ (1 , 2 , 24 , 2^{24})
- h If $(x^3, y^2) = (1, 4)$, $x > y$, then $xy = \dots\dots\dots$ (4 , 2 , -2 , -4)
- i $y \propto \frac{1}{\sqrt{x}}$, then x varies
(inversely as y^2 , directly as y , directly as y^2 , inversely as y)

2- Answer each of the following:

- a If $y = a - 9$ and $y \propto \frac{1}{x^2}$ and $a = 18$ when $x = \frac{2}{3}$, find the relation between y and x ,
then deduce the value of y when $x = 1$

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- b If $X = \{1, 4, 7\}$, $Y = \{4\}$, $Z = \{3, 7\}$, Find:

1) $X \times Z$

2) $n(X \times Z)$

3) $(Y \cap X) \times (X - Y)$

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- c The following frequency distribution shows the ages of 10 children:

Age in year	5	8	9	10	12	Total
Number of children	1	2	3	3	1	10

Calculate the mean and standard deviation of the ages in years.

- d If $f(x) = x^2 - 3x$, $g(x) = x - 3$

1) Find: $f(\sqrt{2}) + 3g(\sqrt{2})$

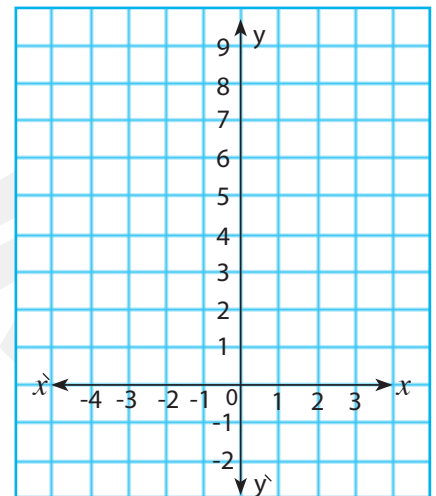
2) Prove that: $f(3) = g(3) = 0$

- e Represent graphically the function $f(x) = x^2 + 2x + 1$, where $x \in [-4, 2]$ and from the graph **identify**:

a) The vertex of the curve

b) The equation of the axis of symmetry

c) The maximum or minimum value



- f If the range of values 2, 7, x , 6 is 8 where $x > 0$, then find the value of x .

g If a, b, c and d are in continued proportion, **prove that:** $\frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$

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1- Choose the correct answer:

- a If 3, x and $\frac{1}{y}$ are in the continued proportion, then $x^2 y = \dots\dots\dots$ (3 , 9 , 18 , $\frac{1}{3}$)
- b If $\frac{a+2b}{a-b} = \frac{2}{3}$, then $\frac{a}{b} = \dots\dots\dots$ (- 8 , $-\frac{1}{8}$, -1 , 8)
- c The positive middle proportional between a and b is $\dots\dots\dots$ ($\sqrt{ab}$, ab , $-\sqrt{ab}$, $\pm\sqrt{ab}$)
- d If $\sum (x - \bar{x})^2 = 12$ for the set of 3 values, then $\sigma = \dots\dots\dots$ (12 , 4 , 2 , 3)
- e The positive square root of the average of squares of deviations of the values from their mean is called $\dots\dots\dots$ (standard deviation , mode , mean , median)
- f If the relation $R = \{ (4, 3), (1, 3), (2, 5) \}$, then R represents a function where its range is $\dots\dots\dots$ ($\{1, 2, 4\}$, $\{4, 1, 2, 3, 5\}$, $\{3, 5\}$, $\mathbb{N}$)
- g If the point $(x - 4, 2 - x)$ where $x \in \mathbb{Z}$ is located in the third quadrant, then $x = \dots\dots\dots$ (2 , 3 , 4 , 6)
- h If y varies inversely as x and $x = \sqrt{3}$, when $y = \frac{2}{\sqrt{3}}$, then the proportional constant = $\dots\dots\dots$ (1 , 2 , $\sqrt{3}$, -1)
- i The most common value of set of individuals is called $\dots\dots\dots$ (mean , mode , range , median)

2- Answer each of the following:

- a If $(x + 1, 9) = (5, 3y)$, then find the value of x and y .
- $\dots\dots\dots$
- $\dots\dots\dots$
- $\dots\dots\dots$
- b Calculate the mean and the standard deviation of the following values:
- 8, 9, 7, 6, 5
- $\dots\dots\dots$
- $\dots\dots\dots$
- $\dots\dots\dots$

c If $X = \{1, 2, 3\}$, $Y = \{3, 4\}$, **find:**

1) $(Y \cap X) \times Y$

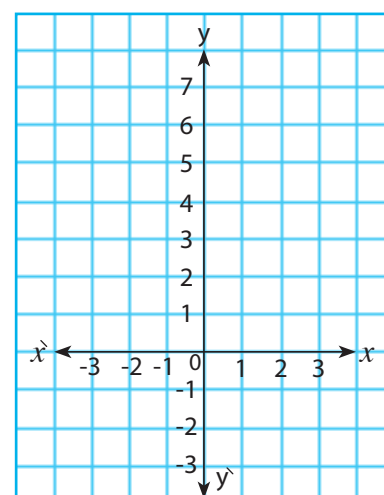
2) $n(X^2)$

d If $f(x) = 2x + b$, and $f(3) = 10$, **find the value of b , then find $f(0.5)$:**

e If the curve of the function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = m - x^2$ intersects the X - axis at the point $(-2, b)$, **find the value of $m^b + 2m$.**

- f** Represent the given function graphically and from the graph deduce the coordinates of the vertex of the curve, the equation of the line of symmetry and the maximum or minimum value of the function, where $x \in \mathbb{R}$

$$f: f(x) = x^2 - 2 \text{ taking } x \in [-3, 3]$$



- g** If $x^4 y^2 - 14 x^2 y + 49 = 0$, **prove that:** $y \propto \frac{1}{x^2}$

1- Choose the correct answer:

9

- a If $3^{x-3} = 1$, then $x =$ (3 , 0 , -3 , 1)
- b The mean of the values 7 , 3 , 6 , 9 , 5 equals (3 , 6 , 4 , 12)
- c The middle proportional between a and c is
($\sqrt{a+c}$, $\frac{a+c}{2}$, $\pm \sqrt{ac}$, ac)
- d If $(2, 5) \in \{2, 7\} \times \{x, 9\}$, then $x =$ (3 , 5 , 7 , 9)
- e If the point $(x - 3, 1 - x)$ where $x \in \mathbb{Z}$ is located in the third quadrant, then $x =$
(2 , 3 , 4 , 6)
- f If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then $k =$ (8 , 9 , 13 , 14)
- g If $n(X^2) = 4$, $n(X \times Y) = 8$, then $n(Y^2) =$ (4 , 9 , 16 , 12)
- h The linear function defined by the rule $y = 2x - 1$ is represented by a straight line intersecting the y-axis at the point
((0, 1) , (0, -1) , (1, 0) , (-1, 0))
- i If $f(x) = kx + 8$, $f(2) = 0$, then $k =$ (-4 , 4 , 6 , 8)

2- Answer each of the following:

21

- a If $y \propto x$, and $y = 9$ as $x = 3$, then **find the relation between y and x.**

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- b If $X = \{1, 4, 7\}$, $Y = \{4\}$, $Z = \{3, 7\}$, **Find**

1. $X \times Z$

2. $n(X \times Z)$

3. $(Y \cap X) \times (X - Y)$

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c If $\frac{x-2y}{x+3y} = \frac{1}{3}$, find: $\frac{y}{x}$

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- d The following frequency distribution shows the number of children of some families in a new city:

Number of children	0	1	2	3	4
Number of families	8	16	50	20	6

Calculate the mean and the standard deviation of the number of children:

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- e Find the number that if it is added to each of the numbers 4, 7, 10 and 15, they become proportional.

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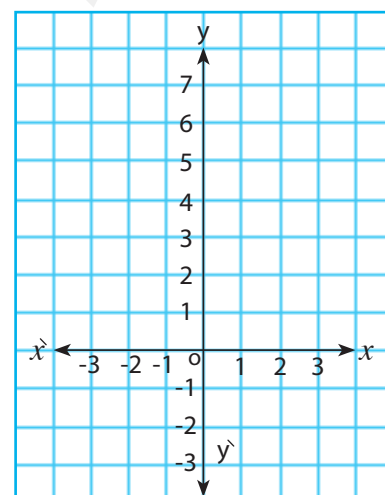
- f Represent the given function graphically and from the graph deduce the coordinates of the vertex of the curve, the equation of the line of symmetry and the maximum or minimum value of the function, where $x \in \mathbb{R}$

$f: f(x) = x^2 - 2$ taking $x \in [-3, 3]$

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g If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4}$, prove that $2a - 5b + 3c =$ one of the given ratios.

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1- Choose the correct answer:

9

- a If the slope of the straight line $y + ax + b = 0$ is -3 and passing through $(1, 4)$, then $a + b = \dots\dots\dots$ $(7, -7, 4, -4)$
- b If $\tan 3x = \sqrt{3}$ where $3x$ is the measure of an acute angle, then $x = \dots\dots\dots$ $(20^\circ, 30^\circ, 45^\circ, 60^\circ)$
- c The distance between the point $(\sqrt{3}, 1)$ and the origin point is $\dots\dots\dots$ units $(4, 3, 2, 1)$
- d The triangle ABC, if $\sin A = \cos B$, then triangle ABC is a/an $\dots\dots\dots$ -angled triangle. $(\text{acute}, \text{obtuse}, \text{right}, \text{reflexed})$
- e A circle of center at the origin point and its radius is 2 units length, which of the following points belongs to the circle? $[(2, 2), (\sqrt{3}, 1), (3, 1), (1, 2)]$
- f $3 \cos 30^\circ = \dots\dots\dots$ $(\frac{3\sqrt{3}}{2}, \frac{\sqrt{3}}{2}, \frac{1}{2}, 1)$
- g A square its area is 36 cm^2 , then its perimeter is $\dots\dots\dots$ cm. $(16, 24, 4, 6)$
- h $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$ and the slope of $\overleftrightarrow{AB} = \frac{1}{2}$, then the slope of $\overleftrightarrow{CD} = \dots\dots\dots$ $(2, \frac{1}{2}, -\frac{1}{2}, -2)$
- i The number of medians of the isosceles triangle is $\dots\dots\dots$ $(1, 0, 3, 2)$

2- Answer each of the following:

21

- a If the straight line which passes through the two points $(-1, 7)$ and $(9, 3)$ is perpendicular to the straight line whose equation is $x + ky - 13 = 0$, **find the value of k.**
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- b** If $\sin x = \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$ where $0^\circ < x < 90^\circ$

Find the value of x

- c** Find the equation of the straight line passing through the point $(5, 6)$ and makes with the positive direction of X-axis a positive angle of measure 45°

- d** If the distance between the point $(x, 3)$ and the point $(7, -1)$ equals $\sqrt{80}$ length units, **find the value of x**

- e** If the ratio between the measures of two supplementary angles $4 : 6$, **find the measure of each angle.**

- f** Find: $\cos^2 45^\circ \tan^2 60^\circ - \sin^2 60^\circ \sin^2 30^\circ$.

- g** Prove that the points P $(1, -2)$, Q $(4, 4)$ and R $(7, 10)$ are collinear.

1- Choose the correct answer:

- a If the two straight lines $3x - 4y - 3 = 0$ and $ky + 3x - 8 = 0$ are perpendicular then $k = \dots\dots\dots$ $(-4, 3, -3, \frac{9}{4})$
- b If $\tan (2x - 5)^\circ = 1$ where x is the measure of an acute angle, then $x = \dots\dots\dots^\circ$ $(45, 35, 25, 15)$
- c The number of axes of symmetry of an isosceles triangle equals $\dots\dots\dots$ $(0, 1, 2, 3)$
- d The distance between the point $(4, -3)$ and the x -axis equals $\dots\dots\dots$ units. $(3, 4, -3, 1)$
- e If A, B are two supplementary angles and $m(\angle A) = m(\angle B)$, then $m(\angle B) = \dots\dots\dots^\circ$ $(180, 90, 45, 30)$
- f If $(\overline{AB})$ is a diameter in a circle where $A(3, -5)$ and $B(5, 1)$, then the center of the circle is $\dots\dots\dots$ $[(4, -2), (4, 2), (2, -2), (8, -2)]$
- g For any acute angle A : $\sin A - \cos A \tan A = \dots\dots\dots$ $(0, 1, -1, 2)$
- h If x, y are the measures of two complementary angles and $\sin x = \frac{3}{5}$, then $\cos y = \dots\dots\dots$ $(\frac{4}{5}, \frac{3}{5}, \frac{3}{4}, \frac{5}{3})$
- i The equation of the straight line passing through the origin point and its slope = 3 is $\dots\dots\dots$ $(y = 3x, x = 3y, y = 5x, y = x)$

2- Answer each of the following:

- a If the points $L(3, 2)$, $M(4, -3)$, $N(-1, -2)$ and $O(-2, 3)$ are the vertices of a rhombus. Find :
- 1) The coordinate of the intersection point of the two diagonals.
- 2) The area of the rhombus LMNO.

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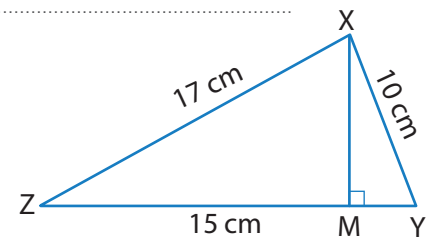
- b** Find the value of x if: $\tan x = \frac{\sin 30^\circ \cos 45^\circ + \sin 45^\circ \cos 30^\circ}{\sin 45^\circ \cos 60^\circ + \sin 45^\circ \sin 60^\circ}$

- c** Find the equation of the straight line whose slope 5 and intercepts from the positive part of y -axis 3 length units.

- d** If $D(a, 5)$, $E(7, -9)$ and $F(3, b)$ is the midpoint of $(\overline{DE})$, **find the value of a and b .**

- e** In the opposite figure: $\overline{XM} \perp \overline{YZ}$, $XZ = 17$ cm, $ZM = 15$ cm, $XY = 10$ cm.

Find the value of : $34 \sin (\angle Z) + 10 \cos (\angle Y)$



- f** If the triangle whose vertices are $A(6, 1)$, $B(2, 4)$, $C(b, -3)$ is right-angled at A , **find the value of b .**

- g** Without using calculator, **prove that: $\sin 60^\circ = 2 \sin 30^\circ \cos 30^\circ$**

1- Choose the correct answer:

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- a $\tan (45^\circ) = \dots\dots\dots$ $(1, \sqrt{3}, \sqrt{2}, \frac{1}{\sqrt{2}})$
- b If ABCD is a square where A (3, 4) and C (5, 6), then the midpoint of its diagonal is $\dots\dots\dots [(8, 10), (10, 8), (4, 5), (15, 24)]$
- c If the two straight lines $3x - 4y - 7 = 0$ and $my + 3x = 3$ are perpendicular, then the value of $m = \dots\dots\dots (\frac{9}{4}, \frac{1}{3}, \frac{5}{2}, \frac{4}{3})$
- d If (3, -4) is the midpoint of $\overline{AB}$ where A (1, 2) then the coordinates of B is $\dots\dots\dots [(5, -10), (-10, 5), (2, 5), (5, 2)]$
- e The equation of the straight line which passes through the point (7, -2) and parallel to X-axis is $\dots\dots\dots (x = 2, y = -2, y = 2, x = 1)$
- f The radius length of the circle whose center is (7, 4) and passes through (3, 1) equals $\dots\dots\dots$ length units. $(5, -5, 2.5, 25)$
- g The slope of the straight line parallel to the X-axis is $\dots\dots\dots (-1, 0, 1, \text{undefined})$
- h If $x = \sin 60^\circ \tan 45^\circ$, then $x^2 = \dots\dots\dots (\frac{1}{3}, \frac{3}{4}, \frac{1}{5}, \frac{2}{5})$
- i If $\sin x = \frac{1}{2}$, where x is an acute angle, then $m(\angle x) = \dots\dots\dots^\circ$ $(45, 60, 30, 90)$

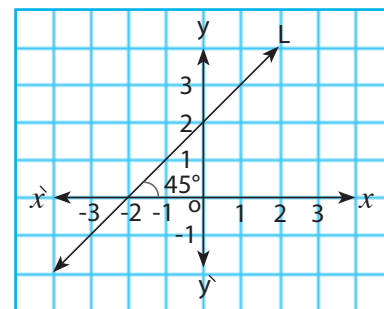
2- Answer each of the following:

21

- a Find the length of $\overline{XY}$: if X (2, 2), and Y (5, -1)
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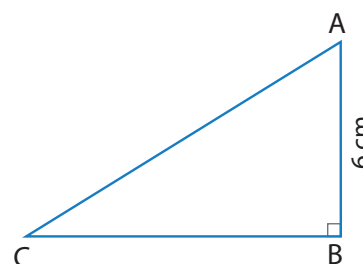
b From the opposite figure, **find:**

- 1) The slope of the straight line L**
- 2) The length of the y-intercept**
- 3) The equation of the straight line L**



c In the opposite figure ABC is a right – angled triangle at B , $AB = 6 \text{ cm}$, $\tan C = \frac{3}{4}$,
find:

- 1) The length of each of $\overline{BC}$ and $\overline{AC}$**
- 2) $\sin A + \cos A$**



d If $\overleftrightarrow{AB} \parallel y\text{-axis}$, where $A(x, 5)$, $B(6, 2)$, **find the value of x .**

e Prove that the points $L(-1, 1)$, $M(0, 5)$, $N(5, 6)$ and $O(4, 2)$ are the vertices of a parallelogram.

- f** Prove that: the straight line passing through the two points (3,2) and (6,5) is parallel to the straight line that makes a positive angle of measure 45° with the positive direction of the X-axis.

- g** If $\sin^2 45^\circ = \cos x \tan 30^\circ$ where x is the measure of an acute angle, **find the value of: x**

1- Choose the correct answer:

- a ABC is a right-angled triangle at B. if $AC = 5$ cm , $BC = 3$ cm , then $AB =$ cm.
(3 , 4 , 5 , 9)
- b For any acute angle A : $\sin A - \cos A \tan A =$ (0 , 1 , -1 , 2)
- c The radius length of the circle whose center is $(-1, 2)$ and passes through $(3, 5)$ equals length units. (5 , -5 , 2.5 , 25)
- d The slope of the straight line which makes an angle of measure 45° with the positive direction of X – axis is (1 , 2 , 0.5 , 3)
- e If $\tan 3x = 1$, where $3x$ is the measure of an acute angle then $x =$
(20° , 30° , 45° , 15°)
- f If ABCD is a square where A $(2, 3)$ and C $(6, 7)$, then the midpoint of its diagonal is
($(8, 10)$, $(10, 8)$, $(4, 5)$, $(15, 24)$)
- g The number of medians of the isosceles triangle is (1 , 0 , 3 , 2)
- h The equation of the straight line passing through the origin point and its slope = 5 is
($y = 3x$, $x = 3y$, $y = 5x$, $y = x$)
- i If x, y are the measure of two complementary angles and $\sin x = \frac{4}{5}$,
then $\cos y =$
($\frac{4}{5}$, $\frac{3}{5}$, $\frac{3}{4}$, $\frac{5}{3}$)

2- Answer each of the following:

- a If A $(5, -6)$, B $(3, 7)$ and C $(1, -3)$, find the equation of the straight line which passes through the point A and the midpoint of $\overline{BC}$.

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- b** ABC is a right-angled triangle at B , if $2 AB = \sqrt{3} AC$,
find the main trigonometrical ratios of the angle C.

- c** Prove that the triangle whose vertices are A (5 , -5) , B (-1 , 7)
and C (15 , 15) is right-angled at B , **then find its area .**

- d** If the ratio between the measures of two supplementary angles 3 : 5 , **find the degree measure of each one**

- e** Prove that : the straight line passing through the two points (2 , - 1) and (6 , 3) is parallel to the straight line that makes a positive angle of measure 45° with the positive direction of the X-axis.

- f** If $12 \tan^2 \theta = 16 \sin^2 30^\circ + 32 \cos^2 60^\circ$, **find θ .**

- g** Prove that the points A (-2 , 7) , B(-3 , 4) and C(1 , 16) are collinear.

1- Choose the correct answer:

- a If $X = \{6\}$, then $n(X^2) = \dots\dots\dots$ ($\emptyset$, 0 , 1 , 2)
- b The vertex of the curve that represents the function $f(x) = x^2 - 4x + 5$ is $\dots\dots\dots$
((3, 1) , (2, 4) , (1, 5) , (2, 1))
- c If $a > 5$, then the point (5 , $a - 5$) lies in the $\dots\dots\dots$ quadrant .
(1st , 2nd , 3rd , 4th)
- d The difference between the greatest and smallest value is called $\dots\dots\dots$
(range , median , mode , standard deviation)
- e If $n(X) = 6$, $n(X \times Y) = 18$, then $n(Y) = \dots\dots\dots$ (3 , 6 , 18 , 36)
- f If $3^{(x+7)} = 1$, then $x = \dots\dots\dots$ (-1 , 7 , -7 , 1)
- g If $g(x) = x^2 + 1$, $x \in [-4 , 2]$, then $g(x) \in \dots\dots\dots$
([1, 17] , [1, 4] , [0, 16] , [5, 20])
- h If 7 , x and $\frac{1}{y}$ are in the continued proportion, then $x^2 y = \dots\dots\dots$
(7 , 14 , 49 , $\frac{1}{7}$)
- i The linear function defined by the rule $y = 2x - 1$ is represented by a straight line intersecting the y-axis at the point = $\dots\dots\dots$ ((0, 1) , (0, -1) , (1, 0) , (-1, 0))

2- Answer each of the following:

- a Find the number that if it is added to each of the numbers 3 , 5 , 8 and 12, they become proportional.

Let the number be x

$\therefore 3 + x , 5 + x , 8 + x , 12 + x$ are proportional

$$\therefore \frac{3+x}{5+x} = \frac{8+x}{12+x}$$

$$\therefore 40 + 13x + x^2 = 36 + 15x + x^2$$

$$\therefore 40 - 36 = 15x - 13x$$

$$\therefore 4 = 2x$$

$$\therefore x = 2$$

$$\therefore \text{The required number} = 2$$

b If $(x^3 - 1, 4) = (7, y)$, find the value of $4y + x$

$$\therefore (x^3 - 1, 4) = (7, y)$$

$$\therefore x^3 - 1 = 7$$

$$\therefore x^3 = 8$$

$$\therefore x = 2$$

$$, y = 4$$

$$\text{then, } 4y + x = 4 \times 4 + 2 = 18$$

c If $\frac{x}{y} = \frac{2}{5}$, find the value of $\frac{3x - y}{2y - 3x}$.

$$\text{If } \frac{x}{y} = \frac{2}{5}$$

$$\therefore x = 2 \text{ m}, y = 5 \text{ m}$$

$$\frac{3x - y}{2y - 3x} = \frac{3 \times 2 \text{ m} - 5 \text{ m}}{2 \times 5 \text{ m} - 3 \times 2 \text{ m}} = \frac{6 \text{ m} - 5 \text{ m}}{10 \text{ m} - 6 \text{ m}} = \frac{1}{4}$$

d Calculate the mean and the standard deviation for the following frequency distribution:

Sets	0-	4-	8-	12-	16 - 20	Total
Frequency	3	4	7	2	9	25

We find the mean of the ages using the table:

The center of the set = (lower limit + upper limit) $\div$ 2

Sets	x	k	$x \times k$
0-	2	3	6
4-	6	4	24
8-	10	7	70
12-	14	2	28
16-20	18	9	162
total		25	290

$$\text{The mean } (\bar{x}) = \frac{\sum x \times k}{\sum k} = 290 \div 25 = 11.6$$

We form the table:

x	k	$x - \bar{x}$	$(x - \bar{x})^2$	$(x - \bar{x})^2 \times k$
2	3	$2 - 11.6 = -9.6$	92.16	276.48
6	4	$6 - 11.6 = -5.6$	31.36	125.44
10	7	$10 - 11.6 = -1.6$	2.56	17.92
14	2	$14 - 11.6 = 2.4$	5.76	11.52
18	9	$18 - 11.6 = 6.4$	40.96	368.64
	25			800

The standard deviation $\sigma = \sqrt{\frac{\sum(x - \bar{x})^2 \times k}{\sum k}} = \sqrt{\frac{800}{25}} \approx 5.7$

e If $y \propto x$ and $y = 6$, at $x = 12$, **find:**

1) The relation between y and x

2) The value of y at $x = 14$

If $y \propto x$ $\therefore y = mx$

$\therefore y = 6$, at $x = 12$ $\therefore 6 = m \times 12$ $\therefore m = \frac{1}{2}$

The relation: $y = \frac{1}{2}x$

at $x = 14$:

$y = \frac{1}{2} \times 14$ $\therefore y = 7$

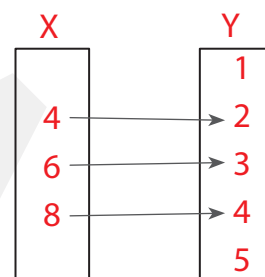
f If $X = \{4, 6, 8\}$, $Y = \{1, 2, 3, 4, 5\}$ and R is a relation from X to Y where " $a R b$ " means " $a = 2b$ " for each $a \in X$, $b \in Y$.

1) Write R and represent it by an arrow diagram.

2) Show that R is a function or not and find its range.

1) $R = \{(4, 2), (6, 3), (8, 4)\}$

2) R is a function because each element in X has one image in Y and its range = $\{2, 3, 4\}$



g Two integers, the ratio between them is $1 : 2$ and if we subtracted 5 from each term, the ratio between them becomes $1 : 3$, **find the two numbers.**

Let the two numbers be a and b

$\therefore \frac{a}{b} = \frac{1}{2}$

$\therefore a = m, b = 2m$

$\therefore \frac{m-5}{2m-5} = \frac{1}{3}$

$\therefore 3m - 15 = 2m - 5$

$\therefore m = 10$

$\therefore$ The two integers are 10 and 20

1- Choose the correct answer:

- a If all individuals are equal, then ($x = 0$, mode = 0 , $\bar{x} = 0$, $\sigma = 0$)
- b The vertex of the curve that represents the function $f(x) = 2x^2 - 4x + 5$ is
((1,3) , (3, 1) , (2, 4) , (1,5))
- c The set of images of each element of the domain of the function is called the.....
(domain , codomain , rule , **range**)
- d The mean of the values 10 , 4 , 5 , 6 , 5 is (10 , **6** , 12 , 5)
- e The function f where $f(x) = x^4 - 2x^3 + 7$ is a polynomial function of the degree.
(first , second , third , **fourth**)
- f The middle proportional between a and c is ($\sqrt{(a+c)}$, $\frac{a+c}{2}$, $\pm\sqrt{ac}$, ac)
- g $2^{25} = 2^{24} + \dots$ (1 , 2 , 24 , **2^{24}**)
- h If $(x^3, y^2) = (1, 4)$, $x > y$, then $xy = \dots$ (4 , 2 , **-2** , -4)
- i $y \propto \frac{1}{\sqrt{x}}$, then x varies
(**inversely as y^2** , directly as y , directly as y^2 , inversely as y)

2- Answer each of the following:

- a If $y = a - 9$ and $y \propto \frac{1}{x^2}$ and $a = 18$ when $x = \frac{2}{3}$, **find the relation between y and x , then deduce the value of y when $x = 1$**
- $\therefore y = a - 9$, $y \propto \frac{1}{x^2}$ $\therefore y = \frac{m}{x^2}$
- $\therefore \frac{m}{x^2} = a - 9$ $\therefore m = x^2 (a - 9)$
- $\therefore a = 18$ when $x = \frac{2}{3}$
- $\therefore m = \frac{4}{9} (18 - 9) = 4$
- $\therefore y = \frac{4}{x^2}$
- As $x = 1$ $\therefore y = 4$

- b** If $X = \{1, 4, 7\}$, $Y = \{4\}$, $Z = \{3, 7\}$, **Find:**

1) $X \times Z$

2) $n(X \times Z)$

3) $(Y \cap X) \times (X - Y)$

1) $X \times Z = \{1, 4, 7\} \times \{3, 7\} = \{(1, 3), (1, 7), (4, 3), (4, 7), (7, 3), (7, 7)\}$

2) $n(X \times Z) = 3 \times 2 = 6$

3) $(Y \cap X) \times (X - Y) = \{4\} \times \{1, 7\} = \{(4, 1), (4, 7)\}$

- c** The following frequency distribution shows the ages of 10 children:

Age in year	5	8	9	10	12	Total
Number of children	1	2	3	3	1	10

Calculate the mean and standard deviation of the ages in years.

We find the mean of the ages using the table:

Age (x)	Number of children(k)	$x \times k$
5	1	5
8	2	16
9	3	27
10	3	30
12	1	12
total	10	90

The mean $(\bar{x}) = \frac{\sum x \times k}{\sum k} = 90 \div 10 = 9$

We form the table:

x	k	$x - \bar{x}$	$(x - \bar{x})^2$	$(x - \bar{x})^2 \times k$
5	1	$5 - 9 = -4$	16	16
8	2	$8 - 9 = -1$	1	2
9	3	$9 - 9 = 0$	0	0
10	3	$10 - 9 = 1$	1	3
12	1	$12 - 9 = 3$	9	9
total	10			30

The standard deviation $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2 \times k}{\sum k}} = \sqrt{\frac{30}{10}} \approx 1.7$ years.

- d** If $f(x) = x^2 - 3x$, $g(x) = x - 3$

1) Find: $f(\sqrt{2}) + 3g(\sqrt{2})$

2) Prove that: $f(3) = g(3) = 0$

$$1) f(\sqrt{2}) + 3g(\sqrt{2}) = (\sqrt{2})^2 - 3(\sqrt{2}) + 3(\sqrt{2} - 3)$$

$$= 2 - 3\sqrt{2} + 3\sqrt{2} - 9 = -7$$

$$2) f(3) = 3^2 - 3 \times 3 = 9 - 9 = 0, \quad g(3) = 3 - 3 = 0$$

$$f(3) = g(3) = 0$$

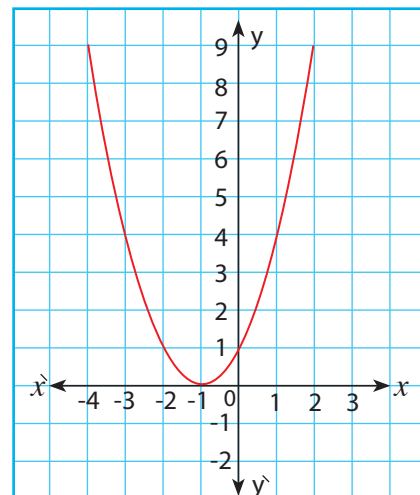
- e Represent graphically the function $f(x) = x^2 + 2x + 1$, where $x \in [-4, 2]$ and from the graph identify:

a) The vertex of the curve

b) The equation of the axis of symmetry

c) The maximum or minimum value

x	-4	-3	-2	-1	0	1	2
$f(x)$	9	4	1	0	1	4	9



From the graph we find that:

(a) The vertex of the curve is $(-1, 0)$

(b) The equation is $x = -1$

(c) The minimum of value = 0

- f If the range of values 2, 7, x , 6 is 8 where $x > 0$, then find the value of x .

If the range is 8, then $x - 2 = 8 \quad \therefore x = 8 + 2 = 10$

- g If a, b, c and d are in continued proportion, prove that: $\frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$

$$\text{Let } \frac{a}{b} = \frac{b}{c} = \frac{c}{d} = m$$

$$c = dm, \quad b = dm^2, \quad a = dm^3$$

$$\frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{d^2 m^6 - 3d^2 m^2}{d^2 m^4 - 3d^2} = \frac{d^2 m^2 (m^4 - 3)}{d^2 (m^4 - 3)} = m^2 \quad (1)$$

$$\frac{b}{d} = \frac{dm^2}{d} = m^2 \quad (2)$$

$$\text{From (1) and (2): } \frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$$

1- Choose the correct answer:

- a If 3, x and $\frac{1}{y}$ are in the continued proportion, then $x^2 y = \dots\dots\dots$ (3 , 9 , 18 , $\frac{1}{3}$)
- b If $\frac{a+2b}{a-b} = \frac{2}{3}$, then $\frac{a}{b} = \dots\dots\dots$ (-8 , $-\frac{1}{8}$, -1 , 8)
- c The positive middle proportional between a and b is $\dots\dots\dots$ ($\sqrt{ab}$, ab , $-\sqrt{ab}$, $\pm\sqrt{ab}$)
- d If $\sum (x - \bar{x})^2 = 12$ for the set of 3 values, then $\sigma = \dots\dots\dots$ (12 , 4 , 2 , 3)
- e The positive square root of the average of squares of deviations of the values from their mean is called $\dots\dots\dots$ (standard deviation , mode , mean , median)
- f If the relation $R = \{ (4, 3), (1, 3), (2, 5) \}$, then R represents a function where its range is $\dots\dots\dots$ ($\{1, 2, 4\}$, $\{4, 1, 2, 3, 5\}$, $\{3, 5\}$, $\mathbb{N}$)
- g If the point $(x - 4, 2 - x)$ where $x \in \mathbb{Z}$ is located in the third quadrant, then $x = \dots\dots\dots$ (2 , 3 , 4 , 6)
- h If y varies inversely as x and $x = \sqrt{3}$, when $y = \frac{2}{\sqrt{3}}$, then the proportional constant = $\dots\dots\dots$ (1 , 2 , $\sqrt{3}$, -1)
- i The most common value of set of individuals is called $\dots\dots\dots$ (mean , mode , range , median)

2- Answer each of the following:

- a If $(x + 1, 9) = (5, 3y)$, then find the value of x and y .
- $\therefore x + 1 = 5$
- , then $x = 5 - 1 = 4 \quad \therefore x = 4$
- $\therefore 9 = 3y$
- $\therefore y = 3$
- b Calculate the mean and the standard deviation of the following values:

8, 9, 7, 6, 5

The mean of the values $\bar{x} = \frac{\sum x}{n} = \frac{8+9+7+6+5}{5} = 7$

x	$x - \bar{x}$	$(x - \bar{x})^2$
8	$8 - 7 = 1$	1
9	$9 - 7 = 2$	4
7	$7 - 7 = 0$	0
6	$6 - 7 = -1$	1
5	$5 - 7 = -2$	4
total		10

The standard deviation $\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{n}} = \sqrt{\frac{10}{5}} \approx 1.41$

c If $X = \{1, 2, 3\}$, $Y = \{3, 4\}$, **find:**

1) $(Y \cap X) \times Y$

2) $n(X^2)$

1) $Y \cap X = \{3\}$

then, $(Y \cap X) \times Y = \{3\} \times \{3, 4\} = \{(3, 3), (3, 4)\}$

2) $n(X^2) = 3 \times 3 = 9$

d If $f(x) = 2x + b$, and $f(3) = 10$, **find the value of b , then find $f(0.5)$:**

$\therefore f(3) = 10$

$\therefore 10 = 2 \times 3 + b$

$\therefore b = 4$

$\therefore f(x) = 2x + 4$

$\therefore f(0.5) = 2 \times 0.5 + 4 = 5$

e If the curve of the function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = m - x^2$ intersects the X -axis at the point $(-2, b)$, **find the value of $m^b + 2m$**

$\therefore$ The curve of the function f intersects the X -axis at the point $(-2, b)$

$\therefore b = 0$

$\therefore (-2, 0)$ satisfies the relation $f(x) = m - x^2$

$\therefore m - (-2)^2 = 0$

$\therefore m = 4$

$\therefore m^b + 2m = 4^0 + 2 \times 4 = 1 + 8 = 9$

f Represent the given function graphically and from the graph deduce the coordinates of the vertex of the curve, the equation of the line of symmetry and the maximum or minimum value of the function, where $x \in \mathbb{R}$

$f: f(x) = x^2 - 2$ taking $x \in [-3, 3]$

$$f(x) = x^2 - 2$$

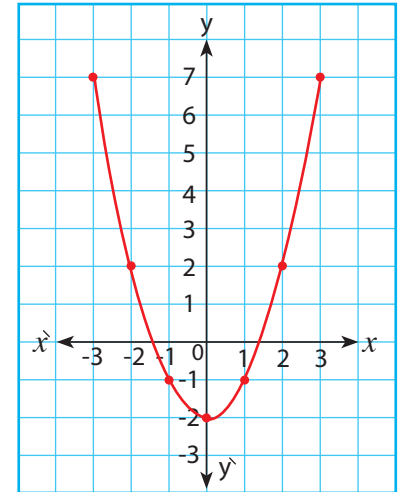
x	-3	-2	-1	0	1	2	3
$f(x)$	7	2	-1	-2	-1	2	7

From the graph

The vertex of the curve is $(0, -2)$

The equation of the line of symmetry is $x = 0$

The minimum value = -2



g If $x^4 y^2 - 14x^2 y + 49 = 0$, **prove that:** $y \propto \frac{1}{x^2}$

$$\therefore x^4 y^2 - 14x^2 y + 49 = 0$$

$$\therefore (x^2 y - 7)^2 = 0$$

$$\therefore x^2 y - 7 = 0$$

$$\therefore x^2 y = 7$$

$$\therefore y \propto \frac{1}{x^2}$$

1- Choose the correct answer:

- a If $3^{x-3} = 1$, then $x = \dots\dots\dots$ (3, 0, -3, 1)
- b The mean of the values 7, 3, 6, 9, 5 equals $\dots\dots\dots$ (3, 6, 4, 12)
- c The middle proportional between a and c is $\dots\dots\dots$ ($\sqrt{a+c}$, $\frac{a+c}{2}$, $\pm\sqrt{ac}$, ac)
- d If $(2, 5) \in \{2, 7\} \times \{x, 9\}$, then $x = \dots\dots\dots$ (3, 5, 7, 9)
- e If the point $(x - 3, 1 - x)$ where $x \in \mathbb{Z}$ is located in the third quadrant, then $x = \dots\dots\dots$ (2, 3, 4, 6)
- f If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then $k = \dots\dots\dots$ (8, 9, 13, 14)
- g If $n(X^2) = 4$, $n(X \times Y) = 8$, then $n(Y^2) = \dots\dots\dots$ (4, 9, 16, 12)
- h The linear function defined by the rule $y = 2x - 1$ is represented by a straight line intersecting the y-axis at the point $\dots\dots\dots$ ((0, 1), (0, -1), (1, 0), (-1, 0))
- i If $f(x) = kx + 8$, $f(2) = 0$, then $k = \dots\dots\dots$ (-4, 4, 6, 8)

2- Answer each of the following:

- a If $y \propto x$, and $y = 9$ as $x = 3$, then **find the relation between y and x.**

$$\text{If } y \propto x \quad \therefore y = mx \quad \therefore 9 = m \times 3 \quad \therefore m = 3$$

The relation is: $y = 3x$

- b If $X = \{1, 4, 7\}$, $Y = \{4\}$, $Z = \{3, 7\}$, **Find**

1. $X \times Z$

2. $n(X \times Z)$

3. $(Y \cap X) \times (X - Y)$

1. $X \times Z = \{1, 4, 7\} \times \{3, 7\} = \{(1, 3), (1, 7), (4, 3), (4, 7), (7, 3), (7, 7)\}$

2. $n(X \times Z) = 3 \times 2 = 6$

3. $(Y \cap X) \times (X - Y) = \{4\} \times \{1, 7\} = \{(4, 1), (4, 7)\}$

c If $\frac{x-2y}{x+3y} = \frac{1}{3}$, find: $\frac{y}{x}$

$$3x - 6y = x + 3y$$

$$2x = 9y$$

$$\frac{y}{x} = \frac{2}{9}$$

- d The following frequency distribution shows the number of children of some families in a new city:

Number of children	0	1	2	3	4
Number of families	8	16	50	20	6

Calculate the mean and the standard deviation of the number of children:

Number of Children (x)	Number of families (k)	$x \times k$
0	8	0
1	16	16
2	50	100
3	20	60
4	6	24
Total	100	200

The mean ($\bar{x}$) = $\frac{200}{100} = 2$ children

x	k	$x - \bar{x}$	$(x - \bar{x})^2$	$(x - \bar{x})^2 \times k$
0	8	$0 - 2 = -2$	4	32
1	16	$1 - 2 = -1$	1	16
2	50	$2 - 2 = 0$	0	0
3	20	$3 - 2 = 1$	1	20
4	6	$4 - 2 = 2$	4	24
total	100			92

The standard deviation (σ) = $\sqrt{\frac{92}{100}} \approx 0.959$

- e Find the number that if it is added to each of the numbers 4 , 7 , 10 and 15 , they become proportional.

Let the number be x

$\therefore 4 + x, 7 + x, 10 + x, 15 + x$ are proportional

$$\therefore \frac{4+x}{7+x} = \frac{10+x}{15+x}$$

$$\therefore 60 + 19x + x^2 = 70 + 17x + x^2$$

$$\therefore 10 - 2x = 0$$

$$\therefore x = 5$$

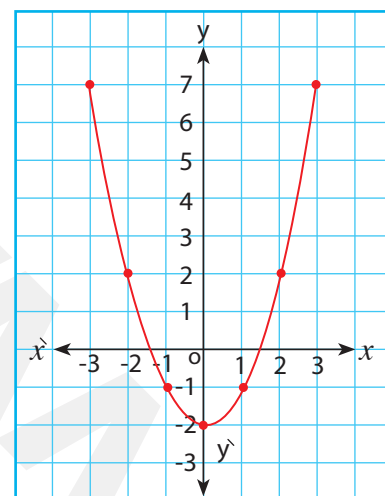
$\therefore$ The required number = 5

- f Represent the given function graphically and from the graph deduce the coordinates of the vertex of the curve, the equation of the line of symmetry and the maximum or minimum value of the function, where $x \in \mathbb{R}$

$$f: f(x) = x^2 - 2 \text{ taking } x \in [-3, 3]$$

$$f(x) = x^2 - 2$$

x	-3	-2	-1	0	1	2	3
$f(x)$	7	2	-1	-2	-1	2	7



From the graph

The vertex of the curve is (0, -2)

The equation of the line of symmetry is $x = 0$

The minimum value = -2

- g If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4}$, prove that $2a - 5b + 3c =$ one of the given ratios.

$$\therefore \frac{a}{2} = \frac{b}{3} = \frac{c}{4}$$

(Multiply the two terms of the first ratio by 2 and the second ratio by -5 and the third by 3 ,then add the antecedents and consequents of the three ratios)

$$\therefore \frac{(2a-5b+3c)}{(4-15+12)} = \text{one of the given ratios}$$

$$\therefore 2a-5b+3c = \text{one of the given ratios}$$

1- Choose the correct answer:

- a If the slope of the straight line $y + ax + b = 0$ is -3 and passing through $(1, 4)$, then $a + b = \dots\dots\dots$ $(7, -7, 4, -4)$
- b If $\tan 3x = \sqrt{3}$ where $3x$ is the measure of an acute angle, then $x = \dots\dots\dots$ $(20^\circ, 30^\circ, 45^\circ, 60^\circ)$
- c The distance between the point $(\sqrt{3}, 1)$ and the origin point is $\dots\dots\dots$ units $(4, 3, 2, 1)$
- d The triangle ABC, if $\sin A = \cos B$, then triangle ABC is a/an $\dots\dots\dots$ -angled triangle. $(\text{acute}, \text{obtuse}, \text{right}, \text{reflexed})$
- e A circle of center at the origin point and its radius is 2 units length, which of the following points belongs to the circle? $[(2, 2), (\sqrt{3}, 1), (3, 1), (1, 2)]$
- f $3 \cos 30^\circ = \dots\dots\dots$ $(\frac{3\sqrt{3}}{2}, \frac{\sqrt{3}}{2}, \frac{1}{2}, 1)$
- g A square its area is 36 cm^2 , then its perimeter is $\dots\dots\dots$ cm. $(16, 24, 4, 6)$
- h $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$ and the slope of $\overleftrightarrow{AB} = \frac{1}{2}$, then the slope of $\overleftrightarrow{CD} = \dots\dots\dots$ $(2, \frac{1}{2}, \frac{-1}{2}, -2)$
- i The number of medians of the isosceles triangle is $\dots\dots\dots$ $(1, 0, 3, 2)$

2- Answer each of the following:

- a If the straight line which passes through the two points $(-1, 7)$ and $(9, 3)$ is perpendicular to the straight line whose equation is $x + ky - 13 = 0$, **find the value of k.**

$$\therefore m_1 = \frac{3-7}{9+1} = \frac{-2}{5}, \quad m_2 = -\frac{1}{k}$$

The two straight lines are perpendicular

$$\therefore m_1 \times m_2 = -1$$

$$\therefore \frac{-2}{5} \times \frac{-1}{k} = -1$$

$$\therefore \frac{2}{5k} = -1$$

$$\therefore -5k = 2$$

$$\therefore K = -\frac{2}{5}$$

- b** If $\sin x = \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$ where $0^\circ < x < 90^\circ$

Find the value of x

$$\sin x = \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} - \frac{1}{2} \times \frac{1}{2}$$

$$\sin x = \frac{1}{2}$$

$$x = 30^\circ$$

- c** Find the equation of the straight line passing through the point (5, 6) and makes with the positive direction of X-axis a positive angle of measure 45°

$$\therefore \text{The slope} = \tan 45^\circ = 1$$

$$\therefore y = x + c$$

$$\therefore \text{The straight line passes through the point (5, 6)}$$

$$\therefore 6 = 5 + c$$

$$\therefore c = 1$$

$$\therefore \text{The equation is : } y = x + 1$$

- d** If the distance between the point (x, 3) and the point (7, -1) equals $\sqrt{80}$ length units, **find the value of x**

$$\sqrt{(x-7)^2 + (3+1)^2} = \sqrt{80}$$

$$\sqrt{(x-7)^2 + 16} = \sqrt{80}$$

$$(x-7)^2 + 16 = 80$$

$$(x-7)^2 = 64$$

$$x-7 = \pm 8$$

$$x-7 = 8 \quad \text{or}$$

$$x-7 = -8$$

$$x = 15$$

$$x = -1$$

- e If the ratio between the measures of two supplementary angles 4 : 6 , **find the measure of each angle.**

Let the measure of two angles be $4x$ and $6x$

$$4x + 6x = 180^\circ$$

$$10x = 180^\circ$$

$$x = \frac{180^\circ}{10} = 18^\circ$$

$$\text{First angle} = 4 \times 18^\circ = 72^\circ$$

$$\text{Second angle} = 6 \times 18^\circ = 108^\circ$$

- f Find: $\cos^2 45^\circ \tan^2 60^\circ - \sin^2 60^\circ \sin^2 30^\circ$.

$$\cos^2 45^\circ \tan^2 60^\circ - \sin^2 60^\circ \sin^2 30^\circ$$

$$= \left(\frac{1}{\sqrt{2}}\right)^2 \times (\sqrt{3})^2 - \left(\frac{\sqrt{3}}{2}\right)^2 \times \left(\frac{1}{2}\right)^2$$

$$= \frac{1}{2} \times 3 - \frac{3}{4} \times \frac{1}{4}$$

$$= \frac{3}{2} - \frac{3}{16} = \frac{21}{16}$$

- g Prove that the points P (1 , -2) , Q (4 , 4) and R (7 , 10) are collinear.

$$\text{Slope of } \overleftrightarrow{PQ} = \frac{4 - (-2)}{4 - 1} = \frac{6}{3} = 2$$

$$\text{Slope of } \overleftrightarrow{QR} = \frac{10 - 4}{7 - 4} = \frac{6}{3} = 2$$

$$\text{The slope of } \overleftrightarrow{PQ} = \text{Slope of } \overleftrightarrow{QR}$$

The points P, Q and R are collinear.

1- Choose the correct answer:

- a If the two straight lines $3x - 4y - 3 = 0$ and $ky + 3x - 8 = 0$ are perpendicular then $k = \dots\dots\dots$ $(-4, 3, -3, \frac{9}{4})$
- b If $\tan (2x - 5)^\circ = 1$ where x is the measure of an acute angle, then $x = \dots\dots\dots^\circ$ $(45, 35, 25, 15)$
- c The number of axes of symmetry of an isosceles triangle equals $\dots\dots\dots$ $(0, 1, 2, 3)$
- d The distance between the point $(4, -3)$ and the x -axis equals $\dots\dots\dots$ units. $(3, 4, -3, 1)$
- e If A, B are two supplementary angles and $m(\angle A) = m(\angle B)$, then $m(\angle B) = \dots\dots\dots^\circ$ $(180, 90, 45, 30)$
- f If $(\overline{AB})$ is a diameter in a circle where $A(3, -5)$ and $B(5, 1)$, then the center of the circle is $\dots\dots\dots$ $[(4, -2), (4, 2), (2, -2), (8, -2)]$
- g For any acute angle A : $\sin A - \cos A \tan A = \dots\dots\dots$ $(0, 1, -1, 2)$
- h If x, y are the measures of two complementary angles and $\sin x = \frac{3}{5}$, then $\cos y = \dots\dots\dots$ $(\frac{4}{5}, \frac{3}{5}, \frac{3}{4}, \frac{5}{3})$
- i The equation of the straight line passing through the origin point and its slope = 3 is $\dots\dots\dots$ $(y = 3x, x = 3y, y = 5x, y = x)$

2- Answer each of the following:

- a If the points $L(3, 2)$, $M(4, -3)$, $N(-1, -2)$ and $O(-2, 3)$ are the vertices of a rhombus.

Find :

1) The coordinate of the intersection point of the two diagonals.

2) The area of the rhombus LMNO.

Let X be the intersection point of the two diagonals

$$X = \left(\frac{3-1}{2}, \frac{2-2}{2} \right) = (1, 0) \quad (1)$$

$$LN = \sqrt{(-1-3)^2 + (-2-2)^2} = \sqrt{32} = 4\sqrt{2} \text{ length units}$$

$$MO = \sqrt{(-2-4)^2 + (3+3)^2} = \sqrt{72} = 6\sqrt{2} = \text{length units}$$

$$\text{The area of rhombus} = \frac{1}{2} \times 4\sqrt{2} \times 6\sqrt{2} = 24 \text{ square units} \quad (2)$$

- b** find the value of x if: $\tan x = \frac{\sin 30^\circ \cos 45^\circ + \sin 45^\circ \cos 30^\circ}{\sin 45^\circ \cos 60^\circ + \sin 45^\circ \sin 60^\circ}$

$$\tan x = \frac{\frac{1}{2} \times \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2}}{\frac{1}{\sqrt{2}} \times \frac{1}{2} + \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2}}$$

$$\therefore \tan x = 1$$

$$\therefore x = 45^\circ$$

- c** Find the equation of the straight line whose slope 5 and intercepts from the positive part of y-axis 3 length units.

$$\therefore y = mx + c$$

$$\text{and slope} = 5, \text{ the intercept part of y-axis} = 3$$

$$\therefore \text{The equation is : } y = 5x + 3$$

- d** If D (a, 5), E (7, -9) and F (3, b) is the midpoint of $\overline{DE}$, find the value of a and b.

$$F(3, b) = \left(\frac{a+7}{2}, \frac{5-9}{2} \right)$$

$$3 = \frac{a+7}{2}$$

$$a+7=6 \quad \therefore a=-1$$

$$b = \frac{5-9}{2}$$

$$2b = -4 \quad \therefore b = -2$$

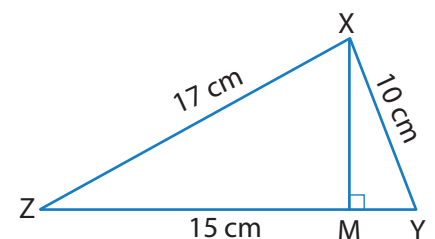
- e** In the opposite figure: $\overline{XM} \perp \overline{YZ}$, $XZ = 17 \text{ cm}$,

$$ZM = 15 \text{ cm}, XY = 10 \text{ cm}.$$

Find the value of : $34 \sin (\angle Z) + 10 \cos (\angle Y)$

$$\text{In } \triangle XMZ, XM = \sqrt{(17)^2 - (15)^2} = 8 \text{ cm}$$

$$\text{In } \triangle XYM, YM = \sqrt{(10)^2 - (8)^2} = 6 \text{ cm}$$



$$\begin{aligned}
 \text{Then, } 34 \sin (\angle Z) + 10 \cos (\angle Y) \\
 &= 34 \times \frac{8}{17} + 10 \times \frac{6}{10} \\
 &= 16 + 6 = 22
 \end{aligned}$$

- f** If the triangle whose vertices are $A = (6, 1)$, $B = (2, 4)$, $C = (b, -3)$ is right-angled at A .

Find the value of b

$\therefore \triangle ABC$ is right-angled at A

$$\therefore \overline{AC} \perp \overline{AB}$$

$$\therefore \text{The slope of } \overleftrightarrow{AB} = \frac{4-1}{2-6} = \frac{-3}{-4}$$

$$\therefore \text{The slope of } \overleftrightarrow{AC} = \frac{-3-1}{b-6} = \frac{-4}{b-6}$$

$$\therefore \overline{AC} \perp \overline{AB}$$

$$\therefore \frac{-3}{-4} \times \frac{-4}{b-6} = -1$$

$$\therefore \frac{12}{4(b-6)} = -1$$

$$\therefore b-6 = -3$$

$$\therefore b = 3$$

- g** Without using calculator, **prove that: $\sin 60^\circ = 2 \sin 30^\circ \cos 30^\circ$**

$$\text{The L.H.S} = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\text{The R.H.S} = 2 \sin 30^\circ \cos 30^\circ$$

$$= 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

$$\therefore \text{L.H.S} = \text{R.H.S}$$

$$\therefore \sin 60^\circ = 2 \sin 30^\circ \cos 30^\circ$$

1- Choose the correct answer:

- a $\tan (45^\circ) = \dots\dots\dots$ $(1, \sqrt{3}, \sqrt{2}, \frac{1}{\sqrt{2}})$
- b If ABCD is a square where A (3, 4) and C (5, 6), then the midpoint of its diagonal is $\dots\dots\dots [(8, 10), (10, 8), (4, 5), (15, 24)]$
- c If the two straight lines $3x - 4y - 7 = 0$ and $my + 3x = 3$ are perpendicular, then the value of $m = \dots\dots\dots (\frac{9}{4}, \frac{1}{3}, \frac{5}{2}, \frac{4}{3})$
- d If (3, -4) is the midpoint of $\overline{AB}$ where A (1, 2) then the coordinates of B is $\dots\dots\dots [(5, -10), (-10, 5), (2, 5), (5, 2)]$
- e The equation of the straight line which passes through the point (7, -2) and parallel to X-axis is $\dots\dots\dots (x = 2, y = -2, y = 2, x = 1)$
- f The radius length of the circle whose center is (7, 4) and passes through (3, 1) equals $\dots\dots\dots$ length units. $(5, -5, 2.5, 25)$
- g The slope of the straight line parallel to the X-axis is $\dots\dots\dots (-1, 0, 1, \text{undefined})$
- h If $x = \sin 60^\circ \tan 45^\circ$, then $x^2 = \dots\dots\dots (\frac{1}{3}, \frac{3}{4}, \frac{1}{5}, \frac{2}{5})$
- i If $\sin x = \frac{1}{2}$, where x is an acute angle, then $m(\angle x) = \dots\dots\dots^\circ$
 $(45, 60, 30, 90)$

2- Answer each of the following:

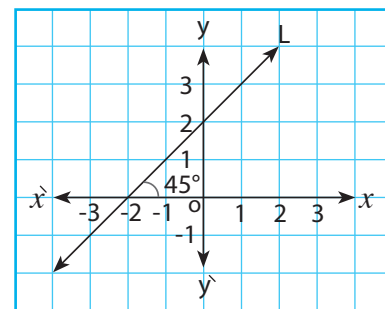
- a Find the length of $\overline{XY}$: if X (2, 2), and Y (5, -1)

$$\text{The length} = \sqrt{(X_2 - X_1)^2 + (y_2 - y_1)^2}$$

$$\begin{aligned} \text{The length} &= \sqrt{(5 - 2)^2 + (-1 - 2)^2} \\ &= \sqrt{9 + 9} = 3\sqrt{2} \text{ length unit} \end{aligned}$$

b From the opposite figure, **find:**

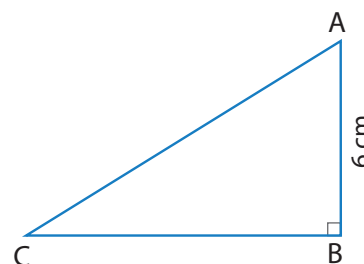
- 1) The slope of the straight line L**
- 2) The length of the y-intercept**
- 3) The equation of the straight line L**



- 1) The slope of the straight line L = $\tan 45^\circ = 1$**
- 2) The length of the y – intercept = 2 units**
- 3) The equation of the straight line L : $y = x + 2$**

c In the opposite figure ABC is a right – angled triangle at B , $AB = 6$ cm, $\tan C = \frac{3}{4}$, **find:**

- 1) The length of each of $\overline{BC}$ and $\overline{AC}$**
- 2) $\sin A + \cos A$**



1) $\because \tan C = \frac{AB}{BC}$

$\therefore \frac{3}{4} = \frac{6}{BC}$

$\therefore BC = 8$ cm

$\therefore (AC)^2 = (AB)^2 + (BC)^2$

$\therefore (AC)^2 = 36 + 64 = 100$

$\therefore AC = 10$ cm

2) $\sin A + \cos A = \frac{8}{10} + \frac{6}{10} = \frac{14}{10} = \frac{7}{5}$

d If $\overleftrightarrow{AB} \parallel y$ – axis , where A (x , 5) , B (6 , 2) , **find the value of x.**

$\because$ The straight line (AB) parallel to y – axis

$\therefore$ The slope is undefined

$\therefore 6 - x = 0 \qquad \therefore x = 6$

e Prove that the points L(–1 , 1) , M(0 , 5) , N (5 , 6) and O (4 , 2) are the vertices of a parallelogram.

The midpoint of $\overline{LN} = \left(\frac{-1+5}{2} , \frac{1+6}{2} \right) = \left(2 , \frac{7}{2} \right)$

The midpoint of $\overline{MO} = \left(\frac{0+4}{2} , \frac{5+2}{2} \right) = \left(2 , \frac{7}{2} \right)$

The midpoint of $\overline{LN} =$ The midpoint of $\overline{MO}$

L , M , N and O are the vertices of a parallelogram.

- f Prove that: the straight line passing through the two points (3,2) and (6,5) is parallel to the straight line that makes a positive angle of measure 45° with the positive direction of the X-axis

$$\therefore m_1 = \frac{5-2}{6-3} = 1, \quad m_2 = \tan 45^\circ = 1$$

$$\therefore m_1 = m_2$$

$\therefore$ The two straight lines are parallel

- g If $\sin^2 45^\circ = \cos x \tan 30^\circ$ where x is the measure of an acute angle, **find the value of: x**

$$\left(\frac{1}{\sqrt{2}}\right)^2 = \cos x \times \frac{1}{\sqrt{3}}$$

$$\cos x = \frac{1}{2} \times \sqrt{3} = \frac{\sqrt{3}}{2}$$

$$\therefore x = 30^\circ$$

1- Choose the correct answer:

- a ABC is a right-angled triangle at B. if $AC = 5$ cm , $BC = 3$ cm , then $AB = \dots\dots\dots$ cm.
(3 , 4 , 5 , 9)
- b For any acute angle A : $\sin A - \cos A \tan A = \dots\dots\dots$ (0 , 1 , -1 , 2)
- c The radius length of the circle whose center is $(-1, 2)$ and passes through $(3, 5)$ equals $\dots\dots\dots$ length units. (5 , -5 , 2.5 , 25)
- d The slope of the straight line which makes an angle of measure 45° with the positive direction of X – axis is $\dots\dots\dots$ (1 , 2 , 0.5 , 3)
- e If $\tan 3x = 1$, where $3x$ is the measure of an acute angle then $x = \dots\dots\dots$
(20° , 30° , 45° , 15°)
- f If ABCD is a square where A $(2, 3)$ and C $(6, 7)$, then the midpoint of its diagonal is $\dots\dots\dots$ ($(8, 10)$, $(10, 8)$, $(4, 5)$, $(15, 24)$)
- g The number of medians of the isosceles triangle is $\dots\dots\dots$ (1 , 0 , 3 , 2)
- h The equation of the straight line passing through the origin point and its slope = 5 is $\dots\dots\dots$ ($y = 3x$, $x = 3y$, $y = 5x$, $y = x$)
- i If x, y are the measure of two complementary angles and $\sin x = \frac{4}{5}$,
then $\cos y = \dots\dots\dots$ ($\frac{4}{5}$, $\frac{3}{5}$, $\frac{3}{4}$, $\frac{5}{3}$)

2- Answer each of the following:

- a If A $(5, -6)$, B $(3, 7)$ and C $(1, -3)$, find the equation of the straight line which passes through the point A and the midpoint of $\overline{BC}$

Let D be the midpoint of $\overline{BC}$

$$\therefore D = \left(\frac{3+1}{2} , \frac{7-3}{2} \right) = (2, 2)$$

$$\therefore \text{The slope of } (\overleftrightarrow{AD}) = \frac{-6-2}{5-2} = -\frac{8}{3}$$

$$\therefore \text{The equation of } (\overleftrightarrow{AD}) \text{ is } y = -\frac{8}{3}x + c$$

$$\therefore D \in (\overleftrightarrow{AD})$$

$\therefore (2, 2)$ satisfies its equation

$$\therefore 2 = -\frac{8}{3} \times 2 + c \quad \therefore c = \frac{22}{3}$$

$$\therefore \text{The equation of } (\overleftrightarrow{AD}) \text{ is } y = -\frac{8}{3}x + \frac{22}{3}$$

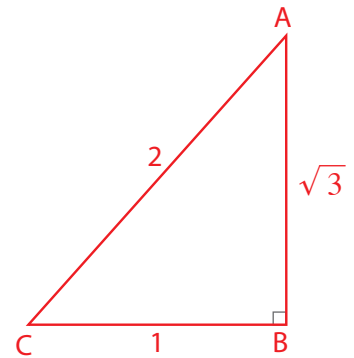
- b** ABC is a right-angled triangle at B, if $2 AB = \sqrt{3} AC$,
find the main trigonometrical ratios of the angle C.

$$\therefore 2 AB = \sqrt{3} AC \quad \therefore \frac{AB}{AC} = \frac{\sqrt{3}}{2}$$

Let $AB = \sqrt{3}$ length unit

$AC = 2$ length unit, $BC = 1$ length unit

$$\therefore \sin C = \frac{\sqrt{3}}{2}, \cos C = \frac{1}{2}, \tan C = \sqrt{3}$$



- c** Prove that the triangle whose vertices are A (5, -5), B (-1, 7) and C (15, 15) is right-angled at B, then find its area.

$$AB = \sqrt{(-1 - 5)^2 + (7 + 5)^2} = \sqrt{36 + 144} = \sqrt{180} \text{ length units}$$

$$BC = \sqrt{(15 + 1)^2 + (15 - 7)^2} = \sqrt{256 + 64} = \sqrt{320} \text{ length units}$$

$$AC = \sqrt{(5 - 15)^2 + (-5 + 15)^2} = \sqrt{100 + 400} = \sqrt{500} \text{ length units}$$

$$(AC)^2 = (AB)^2 + (BC)^2$$

ΔABC is right angled at B

$$\begin{aligned} \text{The area of } \Delta ABC &= \frac{1}{2} \times AB \times BC \\ &= \frac{1}{2} \times \sqrt{180} \times \sqrt{320} = 120 \text{ square units} \end{aligned}$$

- d** If the ratio between the measures of two supplementary angles 3 : 5, find the degree measure of each one

Let the measure of two angles be $3x$ and $5x$

$$3x + 5x = 180^\circ$$

$$8x = 180^\circ$$

$$x = \frac{180^\circ}{8} = 22.5^\circ$$

$$\text{First angle} = 3 \times 22.5^\circ = 67.5^\circ = 67^\circ 30'$$

$$\text{Second angle} = 5 \times 22.5^\circ = 112.5^\circ = 112^\circ 30'$$

- e Prove that : the straight line passing through the two points (2 , - 1) and (6 , 3) is parallel to the straight line that makes a positive angle of measure 45° with the positive direction of the X- axis .

$$m_1 = \frac{3+1}{6-2} = 1 \quad , \quad m_2 = \tan 45^\circ = 1$$

$$m_1 = m_2$$

The two straight lines are parallel

- f If $12 \tan^2 \theta = 16 \sin^2 30^\circ + 32 \cos^2 60^\circ$, find θ .

$$12 \tan^2 \theta = 16 \times \frac{1}{4} + 32 \times \frac{1}{4}$$

$$12 \tan^2 \theta = 4 + 8$$

$$12 \tan^2 \theta = 12 \quad , \quad \tan^2 \theta = 1$$

$$\text{then } \theta = 45^\circ$$

- g Prove that : the points A (-2 , 7) , B(-3 , 4) and C(1 , 16) are collinear.

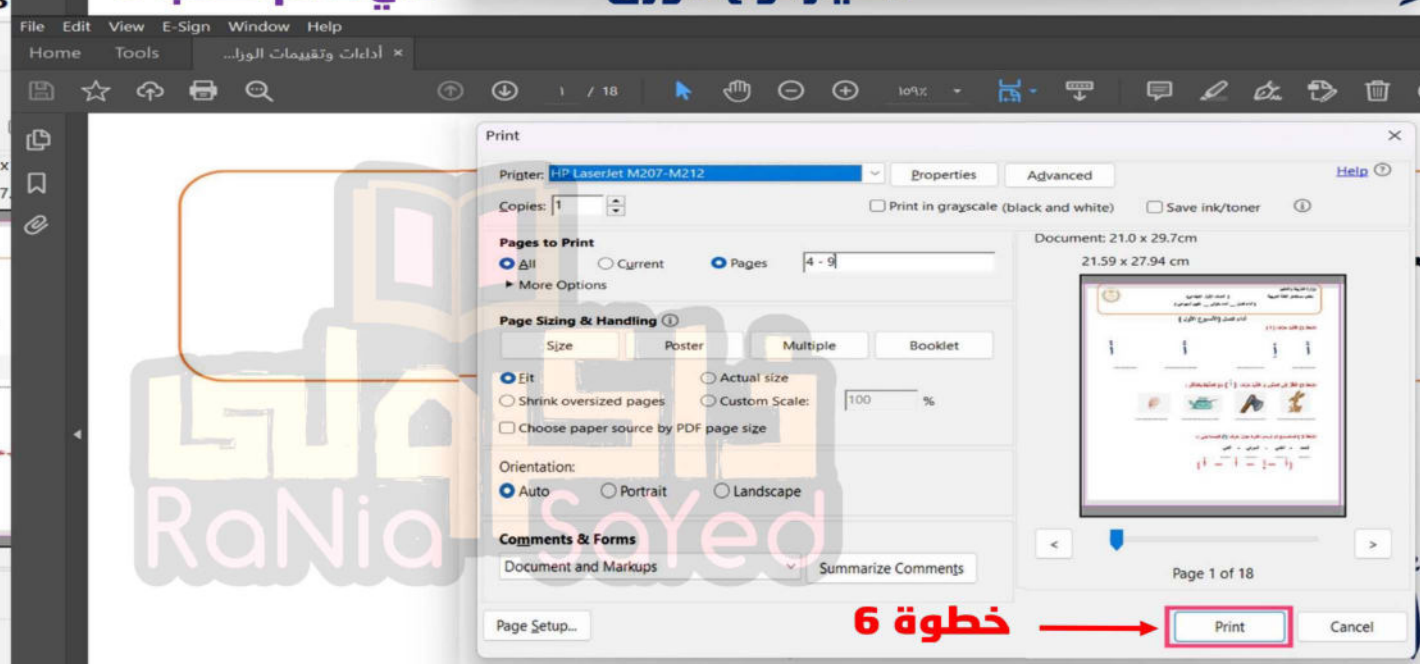
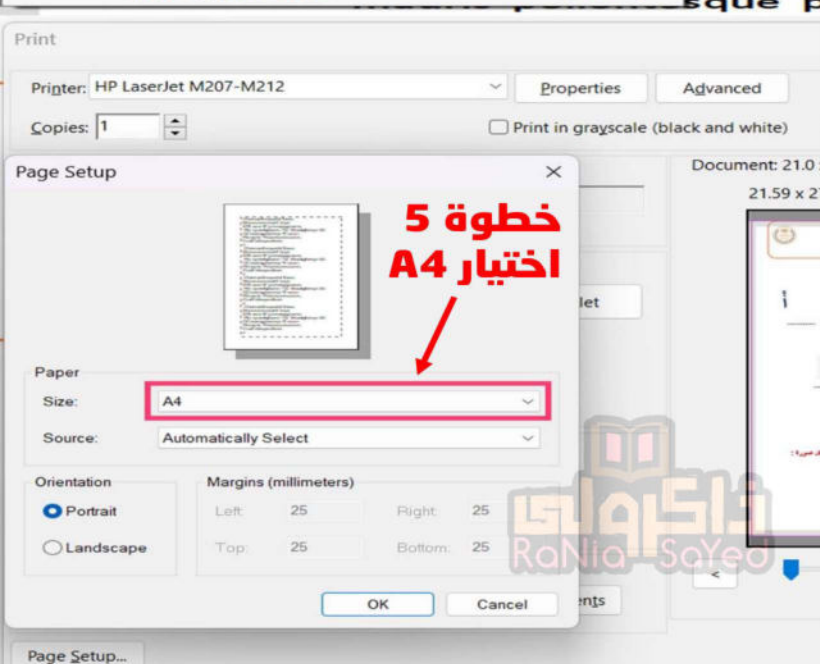
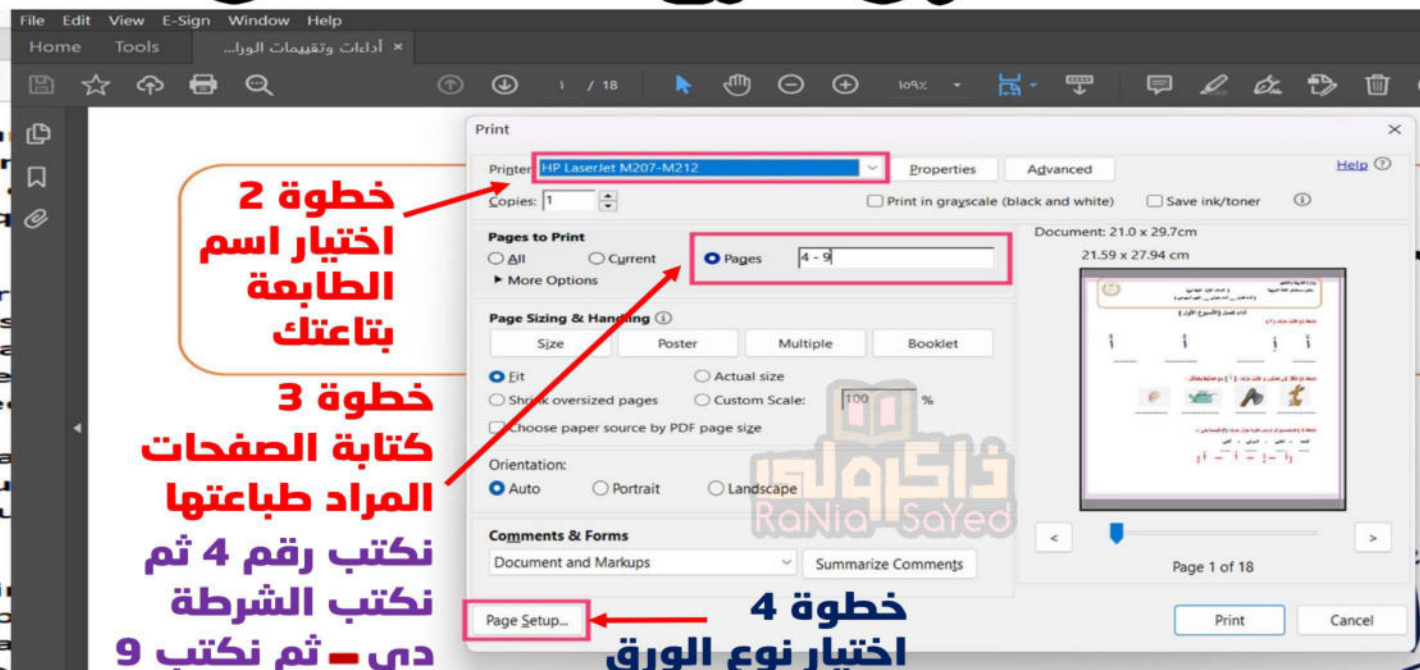
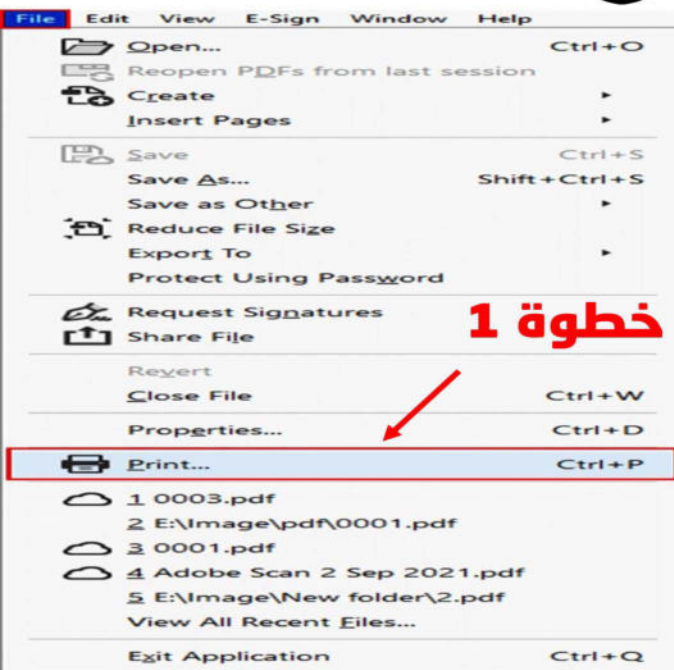
$$\text{Slope of } \overleftrightarrow{AB} = \frac{4-7}{-3+2} = \frac{-3}{-1} = 3$$

$$\text{Slope of } \overleftrightarrow{BC} = \frac{16-4}{1+3} = \frac{12}{4} = 3$$

$$\text{The slope of } \overleftrightarrow{AB} = \text{Slope of } \overleftrightarrow{BC}$$

The points A , B and C are collinear.

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

امتحانات رقم (2)

الترم الاول



ALGEBRA – MODEL No (1)
(DAKAHLIA 2025)

[1] [A] Choose the correct answer:

(1) The range of the set of values: 7, 3, 6, 9, and 5 is

- a) 12 b) 6 c) 4 d) 3

(2) The ratio between the area of a square shaped region of side length (L) cm : The area of square shaped region of side length (3L) cm is

- a) 1 : 3 b) 3 : 1 c) 1 : 9 d) 9 : 1

(3) If X and Y are two sets where $n(X^2) + n(X \times Y) = 5$, then $n(Y^2) = \dots$

- a) 25 b) 16 c) 4 d) 1

[B] If $\mathcal{N}$ is a set of natural numbers, and $\mathcal{R}$ is a relation on $\mathcal{N}$ where " $a \mathcal{R} b$ " means " $a \times b = 8$ " for $a, b \in \mathcal{N}$

- ① Write $\mathcal{R}$ ② If $m \mathcal{R} 4$. Find

[Q2] A] Choose the correct answer:

(1) If $X : Y = 3 : 2$, then $(6X - 9Y - 1)^{2025} = \dots$

- a) -2025 b) -1 c) 1 d) 2025

(2) If the function $\mathcal{F} : \mathcal{F}(x) = (x)^{\frac{3}{k}} + (x)^{2-k}$ is a polynomial function, then the function F of degree

- a) Zero b) First c) Second d) third

(3) If $\mathcal{F} : \mathcal{F}(x) = X^2$ and $X \in [-2, 3]$, then $\mathcal{F}(x) \in \dots$

- a) [4, 9] b) [0, 4] c) [-9, 9] d) [-9, -4]



[B] Calculate the standard deviation for the next data:

4, 8, 12, 10, 6

[Q3]

[A] Choose the correct answer:

(1) If the point (X, Y) lies on the third quadrant, then the point (X^3, Y^2) lies on the quadrant

- a) First b) Second c) Third d) Fourth

(2) If a, b, c are proportional quantities, then $\frac{a}{c} = \dots\dots\dots$

- a) $\frac{b^2}{a^2}$ b) $\frac{c^2}{b^2}$ c) $\frac{b^2}{c^2}$ d) $b^2 c^2$

(3) If $\mathcal{F}: \mathcal{F}(x) = 3x + 5$, and $a + b = 9$

Then $\mathcal{F}(a) + \mathcal{F}(b) = \dots\dots\dots$

- a) 37 b) 32 c) 27 d) 14

[B] If $X = Z + 9$, $Z \propto Y$, and $X = 24$ when $Y = 5$

① Find the relation between X and Y

② Find the value of Y when $Z = 12$



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[Q4] [A] If the value of speed (V) that water passes through a hose nozzle inversely changes with the square of the hose nozzle radius length (r), and $V = 5$ cm/sec. where $r = 3$ cm. Find V when $r = 2.5$ cm.

[B] If $\frac{x+2y}{a+4b} = \frac{2y+5z}{4b+7c} = \frac{5z+x}{7c+a}$.

Prove that: $\frac{x}{y} = \frac{a}{2b}$



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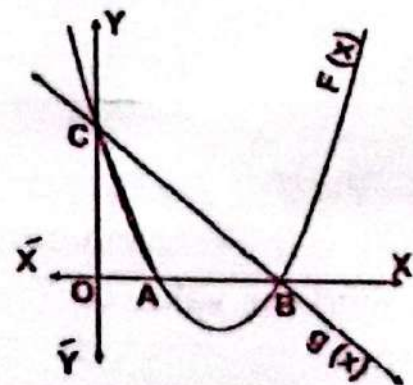
[Q5]

[A] If a, 6, b, 54 are four positive quantities in continued proportion. Find the value of a, b

[B] In the opposite figure:

The straight line $X = 2$ is axis of symmetry of curve of the function $\mathcal{F}(x)$, $\overline{BC}$ is graphically representation of the linear function $g(x) = mX + K$. If the area of $\Delta ABC = 3$ square units. $AB = 2$ length unit

- ① Find the value of m, K
- ② Find $g(4)$



End of the questions

ALGEBRA – MODEL NO (2)

(DAKAHLIA 2024)

[1] [A] Choose the correct answer:

(1) The range of the set of values: 23, 22, 15, 18, 17 is

- a) 8 b) 18 c) 19 d) 23

(2) If $f(x) = 2x - 1$, $g(x) = 4$, then $f(g(x)) = \dots\dots\dots$

- a) 7 b) 4 c) -4 d) -7

(3) If $X = \{a, a^3\}$, then a may be equal

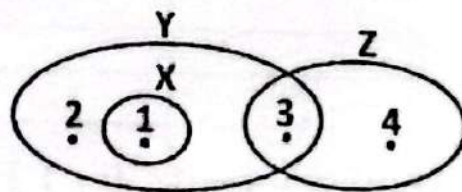
- a) -1 b) Zero c) 1 d) 2

[B] In the opposite figure:

By using Venn diagram

Which represents the sets X, Y, Z

- Find: ① $(X \cap Y) \times Z$
 ② $(X \cup Y) \times (Z - Y)$



[2] [A] Choose the correct answer:

(1) If 10 grams of chocolate give 300 calories, then the number of calories which are found in 30 grams in same chocolate equals ...

- a) 90 b) 100 c) 900 d) 9000

(2) The ratio between

The circumference of circle : the length of its diameter =

- a) $\pi : 1$ b) $1 : \pi$ c) $2\pi : 1$ d) $1 : 2\pi$

(3) If $\frac{a}{b} = \frac{3}{5}$, $5a - 2b = 20$ then $b = \dots\dots\dots$

- a) 3 b) 5 c) 15 d) 20



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[B] If b is the middle proportional between a and c

Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

[3]

[A] Find the standard deviation for the values

5, 6, 7, 8, 9

[B] If $X = \{-1, 0, 1\}$, and $\mathcal{R}$ is relation on X where $a \mathcal{R} b$ means $((b = a^2))$ for each $a, b \in X$. Write $\mathcal{R}$ and show with reason if $\mathcal{R}$ is a function or not? And if $\mathcal{R}$ is a function, mention its range.

[4]

[A] $\frac{x+y}{9} = \frac{y+z}{7}$, prove that: $\frac{x-z}{x+2y+z} = \frac{1}{8}$



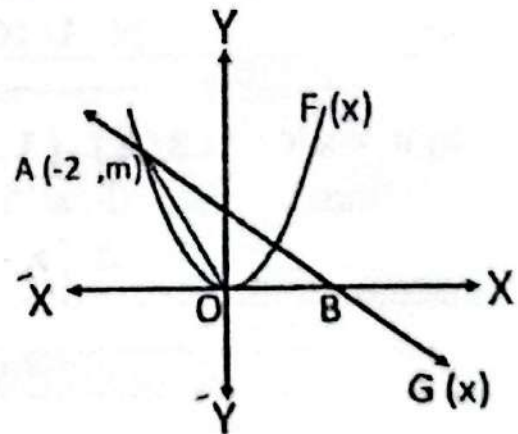
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[5] [A] If $X^4 Y^2 - 14 X^2 Y + 49 = 0$,
 Prove that: Y varies inversely with X^2

The curve represents
The Quadratic function $\mathcal{F}(x) = x^2$
 $\overline{AB}$ represents the linear
Function $G(x) = K - x$
If the coordinates of A $(-2, m)$
Find: ① The value of K, m
② Area of ΔAOB



End of the questions



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ALGEBRA – MODEL NO (3)
(DAKAHLIA 2023)

[01] A) Choose the correct answer:

- (1) The range of the values: $X + 4$, $X - 3$, $X + 8$, where X is a real number is
- a) 1 b) 4 c) 7 d) 11
- (2) If $(a, 4)$ one of the points of function $F: \mathbb{R} \rightarrow \mathbb{R}$, $F(x) = 2X + b$, then $6a + 3b = \dots\dots\dots$
- a) 12 b) 9 c) 6 d) 3
- (3) If the real length is 6 m, length in drawing is 6 cm, then the drawing scale is
- a) 1 : 1 b) 1 : 10 c) 1 : 100 d) 1 : 1000

[B] If $X \times Y = \{(3, 2), (1, 2), (2, 4), (3, 4), (1, 4), (2, 2)\}$

Find:

① X, Y

② $(X - Y) \times (X \cap Y)$

[02] A) Choose the correct answer:

- (1) If $(X + 1, \sqrt{Y}) = (-1, \sqrt[3]{27})$, then (x, y) lies in quadrant
- a) first b) second c) third d) fourth
- (2) If $\frac{a}{b} = \frac{3}{5}$, $5a - 2b = 20$, then $b = \dots\dots\dots$
- a) 3 b) 5 c) 15 d) 20
- (3) If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) - n(Y) = \dots$
- a) 4 b) 5 c) -4 d) ± 4



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[B] Calculate the standard deviation of the values:

8, 9, 7, 6, 5

[Q3] A) Choose the correct answer:

(1) 30 % of 600 =

a) 1.8 b) 18 c) 180 d) 1800

(2) If a, 5, b, 7 are proportion quantities, then $\frac{a}{b} = \dots\dots\dots$

a) $\frac{5}{7}$ b) $\frac{7}{5}$ c) 5 d) 7

(3)

a) 1 : 1 b) 1 : 10 c) 1 : 100 d) 1 : 1000

[B] If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{2}{3}$, and $5a - 3c + e = 18$.

Find the value of: $5b - 3d + f$



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[Q4] [A] If $X = \{1, 3, 4, 5\}$, $Y = \{1, 2, 3, 4, 5, 6\}$ and $\mathcal{R}$ is relation from X to Y where $a \mathcal{R} b$ means " $a + b = 7$ " for $a \in X, b \in Y$.

① Write $\mathcal{R}$ and represents it with arrow diagram.

② Show that if $\mathcal{R}$ is function or not? and why? If it is function find its range.



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[B] IF a, b, c, d are in continued proportion, prove that:

$$\frac{a^2 + b^2 + c^2}{b^2 + c^2 + d^2} = \frac{a}{b} \cdot \frac{c}{d}$$

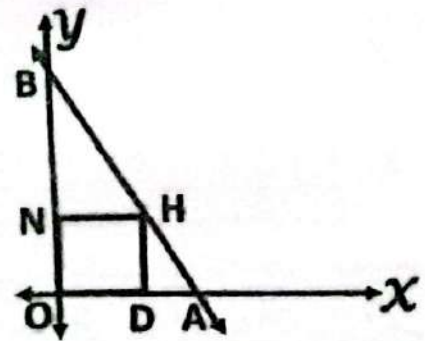
[Q5] [A] If $\mathcal{F}: \mathcal{F}(x) = K X^2 + (3K + 2)X + 6$, and X - coordinate of the vertex of the curve is -2 , find:

- ① The value of K
- ② Minimum or Maximum value of function $\mathcal{F}$

[B] In the opposite figure:

The linear function f where: $f(x) = kx + m$ represent graphically by straight line $\overline{AB}$ where $A(3,0)$, $B(0,6)$, $ONHD$ is square

- ① Write the rule of function f ?
- ② Find the area of square $ONHD$?



.....
End of the questions



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ALGEBRA – MODEL NO (4)

[1] A) Choose the correct answer:

(1) If all values are equal, then

- a) $X - \bar{X} > 0$ b) $X - \bar{X} < 0$ c) $\sigma = 0$ d) $\bar{X} = 0$

(2) If the point $(X - 4, 2 - X)$ lies in the third quadrant, then X may be equals.....

- a) 2 a) 2 a) 2 a) 2

(3) If $\frac{y+3}{y} = \frac{x+2}{x}$ where $X \neq Y \neq 0$, then

- a) $Y \propto X$ a) $Y \propto X$ a) $Y \propto X$ a) $Y \propto X$

[B] Find the arithmetic mean and the standard variation for the following values: 12, 13, 16, 18, 21

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[2] A) Choose the correct answer:(1) If: $a : b : c = 2 : 3 : 4$ then $\frac{a}{b} : \frac{b}{c} : \frac{c}{a} = \dots : \dots : \dots$

- a) 8 : 9 : 24 b) 4 : 9 : 24 c) 8 : 9 : 4 d) 9 : 8 : 24

(2) If $(x + \frac{1}{x}, y^7) = (3, 1)$, then $(x^2 + \frac{1}{x^2} + y^2) = \dots$

- a) 3 b) 4 c) 10 d) 16

(3) If $X = \{3\}$, $n(X) - n(Y) = 1$, then $Y \times X = \dots$

- a) Zero b) $\{(3, 3)\}$ c) $\emptyset$ d) $\{(3, 1)\}$

[B] If $\frac{2a}{3} = \frac{3b}{2} = \frac{5c}{4}$

Find the value of : $\frac{2a+3b+5c}{6a+6b+10c}$



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[3] A) Choose the correct answer:

(1) If F is polynomial function of second degree, $F(K-5) = F(3-K)$, then the equation of axis of symmetry of curve of function is

- a) $X = 1$ b) $X = -1$ c) $Y = 1$ d) $Y = -1$

(2) If $\frac{a}{b} = \frac{3}{5}$, $\frac{c}{a} = \frac{7}{9}$, then $b : c = \dots\dots$

- a) $15 : 7$ b) $7 : 15$ c) $17 : 5$ d) $7 : 5$

(3) Which of the following values has more dispersion is

- a) 28, 17, 30, 36, 20 b) 20, 19, 29, 37, 43 c) 31, 35, 26, 37, 41 d) 25, 39, 19, 5, 27

[B]

If $X = \{1, 4, 7\}$, $Y = \{-1, 1, 4, 7\}$ and $\mathcal{R}$ is relation from X to Y where $a \mathcal{R} b$ means $(|a + b| = 8)$ for each $a \in X$, $b \in Y$, find $\mathcal{R}$ and represents it by arrow diagram, then show that $\mathcal{R}$ is function from X to Y or not? With reason.

[4]

[A] If $F(x) = 2x + K$, $G(x) = x^2 + K$, where K is constant
And $F(2) + G(-4) = 30$. Find $F(-2) - G(2)$

[B] If $Y = a - 1$, $Y \propto \frac{1}{x^2}$, and $a = 4$ where $X = 2$, find the relation between X , Y then find X when $Y = 8$

[5]

[A] If $5a$, $6b$, $7c$, $8d$ are in continued proportion.

Prove that: $\sqrt[3]{\frac{5a}{8d}} = \sqrt{\frac{5a+6b}{7c+8d}}$



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[B] The opposite figure

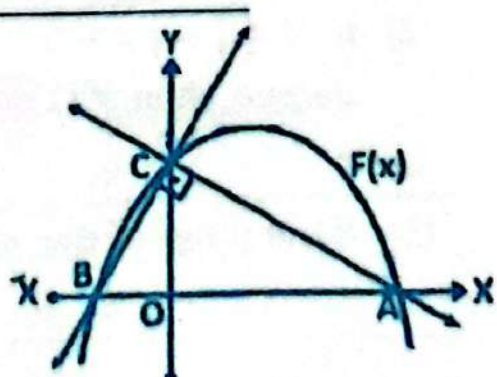
Represents the curve of $F(x)$

$F: F(x) = -\frac{1}{3}x^2 + Kx + m$

If $\vec{AC} \perp \vec{BC}$, $OC = 3$ units, $OA = 9OB$

① Find value of K , m

② Find area of $\triangle ABC$



End of the questions



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ALGEBRA – MODEL No (5)

[1] A) Choose the correct answer:

(1) If $(a^2 - b^2, 3) = (15, a - b)$ then $a + b = \dots\dots\dots$

- a) 3 b) 5 c) 9 d) 15

(2) If $a, 2, b, 3$ are proportional, then $a : b = \dots\dots\dots$

- a) 3 : 2 b) 2 : 3 c) 5 : 3 d) 2 : 15

(3) If $4X^2 + Y^2 = 4XY$, then $\dots\dots\dots$

- a) $Y \propto X$ b) $Y \propto X^2$ c) $Y \propto \frac{1}{x}$ d) $Y \propto \frac{1}{x^2}$

[B] If a, b, c, d are in continued proportional,

Prove that: $\frac{ab - cd}{b^2 - c^2} = \frac{a + c}{b}$

[2] A) Choose the correct answer:

(1) If the point $A(X - 5, X - 3)$ lies on Y-axis, then the point A is.....

- a) (0, 2) b) (2, 0) c) (-2, 0) d) (0, -2)

(2) If $\mathcal{F}(x) = (a - 3)x^2 + 2x - a$ is polynomial function of first degree, then $\mathcal{F}(1) = \dots\dots\dots$

- a) 1 b) 3 c) -1 d) -3

(3) If the range of the values 7, 3, 6, K, 5 is 6, then $K = \dots\dots\dots$

- a) 3 b) 6 c) 9 d) 12



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- [B] If $X = \{3, 4\}$, $Y = \{4, 5\}$, $Z = \{6, 5\}$, find
 ① $X \times (Y \cap Z)$ ② $(X - Y) \times (Y - Z)$

[3] A) Choose the correct answer:

- (1) If $a : b = 5 : 7$, $c : d = 2a : 3b$ then $a c : b d = \dots\dots\dots$
 a) $20 : 38$ b) $50 : 147$ c) $10 : 21$ d) $50 : 151$
- (2) If $X = \{3, a\}$, $Y = \{4, 1 - b\}$, then $(X \cap Y) \cap (X - Y) = \{(5, 3)\}$,
 then $a + b = \dots\dots\dots$
 a) 3 b) 4 c) 7 d) 1
- (3) If Y^2 varies inversely with X and $x = 2$ when $Y = 3$, then $Y = 6$
 when $X = \dots\dots\dots$
 a) $\frac{-1}{4}$ b) $\frac{1}{4}$ c) 54 d) 216

- [B] If $X = \{-2, -3, -4\}$, $Y = \{3, 8, 9, 15\}$ and $\mathcal{R}$ is relation from X
 to Y where $a \mathcal{R} b$ means " $b = a^2 - 1$ " for $a \in X$, $b \in Y$.

- ① Write $\mathcal{R}$ and represents it with arrow diagram.
 ② Show that if $\mathcal{R}$ is function or not? And why?

[4]

- [A] If $a : (b + c) = 1 : 3$, $c : (a + b) = 5 : 7$ then
 find the value of $b : a + c$



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[B] If the straight line which represents the function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 6x - K$ cut Y-axis at point $(m, 3)$.

Find the value of $2K + 7m$

[5]

[A] If the number of hours (n) needed for carrying out a work varies inversely as the number of workers (X) who carry out this work.

If the work is carried out by 6 workers within 4 hours, what is the needed time for carrying out the work by 8 workers?

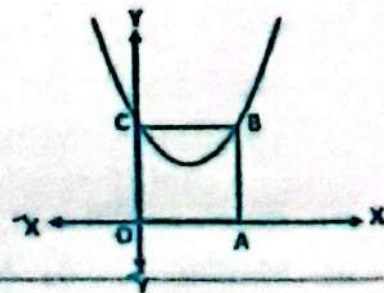
[B] The opposite figure

Represents the curve of $f(x)$

$$f: f(x) = x^2 - (K-2)x - K + 4$$

If the figure OABC is square.

Find the value of K ?



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End of the questions



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ALGEBRA – MODEL NO (6)

[1] A) Choose the correct answer:(1) If the point $(\sqrt{2}, c) \in$ the curve of the $f(x) = x^2 + 1$, then $c = \dots$

- a) 2 b) 3 c) 1 d) -1

(2) If $n(X^2) + n(X \times Y) = 5$, then $n(Y^2) = \dots$

- a) 1 b) 2 c) 9 d) 16

(3) If $X + Z - Y = 0$, $10X + 2Z - 5Y = 0$, then $Y : Z = \dots$

- a) 5 : 8 b) 8 : 5 c) 3 : 8 d) 8 : 3

[B] Find the arithmetic mean and the standard variation for the following values: 72, 53, 61, 70, 59

[2] A) Choose the correct answer:(1) If $(a, 4)$ one of the points of $f: \mathcal{R} \rightarrow \mathcal{R}$, $f(x) = 2x + b$, then $6a + 3b = \dots$

- a) 12 b) 9 c) 6 d) 3

(2) Which of the following one of the dispersion measurement?

- a) Median b) Mean c) Range d) Mode

(3) The relation which represents the direct variation between X, Y is

- a) $XY = 5$ b) $Y = X + 3$ c) $\frac{x}{3} = \frac{4}{y}$ d) $\frac{x}{5} = \frac{y}{2}$



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[B] If $\frac{a}{3x+4y} = \frac{b}{5x-2y} = \frac{c}{y+2x}$, prove that:

$$13X(3c-2a) + 5Y(a+2b) = \text{zero}$$

[3] A) Choose the correct answer:

(1) If : $F(x) = 6$ then $\frac{f(3)}{f(k)} = \dots\dots\dots k \in R$

- a) Zero b) 1 c) 6 d) 12

(2) If the point $(5, 2y-8)$ lies on x-axis then $\sqrt{y} = \dots\dots$

- a) 2 b) ± 2 c) 4 d) ± 4

(3) The positive rational number if we added to the consecutive of the ratio $\frac{3}{5}$ it becomes $\frac{7}{12}$ is $\dots\dots$

- a) 7 b) $\frac{2}{7}$ c) $\frac{3}{7}$ d) $\frac{1}{7}$

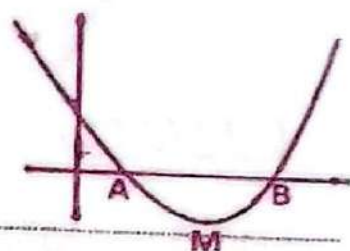
[B] If a, b, c, d are in continued proportion.

Prove that: $\frac{a^2+b^2+c^2}{b^2+c^2+d^2} = \frac{a}{b} \cdot \frac{c}{d}$



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- [4] [A] The opposite figure represents A curve of quadratic function Cut x-axis at points A(1,0) B(4,0) And M is vertex of the curve And $F(-2) + F(7) = 8$. Find $F(-2)$



- [B] IF $X = \{-2, -1, 0, 1, 2\}$ and R is relation on X where $a R b$ means ((a is additive inverse to b)) for each $a \in X, b \in Y$. write R and represents it with arrow diagram and show that R is function or not?



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- [5]
[A] If the weight of a body on the moon (W) is directly proportional with its weight on the ground (R) if the body weights 84 kg. on the ground and its weight on the moon is 14 kg. what will its weight be on the moon if its weight on the ground is 144 kg.?

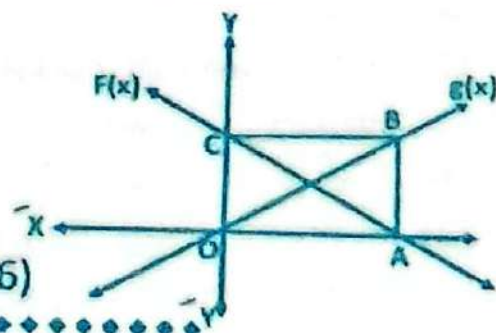
- [B] In the opposite figure:

$\overline{AC}$ represents the linear function

$F(x) = 2 - \frac{2}{3}x$, $\overline{OB}$ represents the

Linear function $G(x) = Kx + m$

If the figure OABC is rectangle, find $G(6)$



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End of the questions



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GEOMETRY – MODEL NO (1)
(DAKHLIA 2025)



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[1] [A] Choose the correct answer:

(1) $2 \sin 30^\circ \cos 60^\circ = \dots\dots\dots$

- a) 2 b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{\sqrt{3}}{4}$

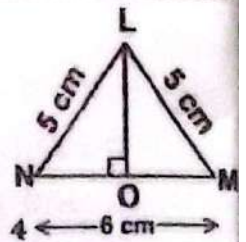
(2) In the opposite figure:

$\triangle LMN$, $LM = LN = 5$ cm

$MN = 6$ cm, $\overline{LO} \perp \overline{MN}$

Then $\sin M = \dots\dots\dots$

- a) $\frac{4}{5}$ b) $\frac{3}{5}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$



(3) The distance between the point $(\sqrt{3}, 1)$ and the origin point is $\dots\dots\dots$ length unit

- a) 4 b) 3 c) 2 d) 1

[B] ABCD is a parallelogram where $A(3, 4)$, $B(2, -1)$, $C(-4, -3)$. Find the coordinates of point D

[Q2]:

[A] Choose the correct answer:

(1) If the Y-axis bisects $\overline{AB}$ where $A(3, 4)$, $B(X, 6)$, then $X = \dots\dots\dots$

- a) -6 b) -4 c) -3 d) Zero

(2) If the area of square 50 cm^2 , then the length of its diagonal equals $\dots\dots\dots$ cm

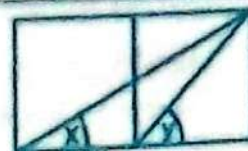
- a) $5\sqrt{2}$ b) 10 c) $10\sqrt{2}$ d) 5

(3) In the opposite figure:

Two congruent squares

Then $\tan X + \tan Y = \dots\dots\dots$

- a) 1 b) $\frac{5}{2}$ c) 2 d) $\frac{3}{2}$



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[B] If: $4 \sin X = \tan^2 60^\circ - 2 \sin 30^\circ$

Without using calculator find the value of X.

Where (X is measure of an acute angle)

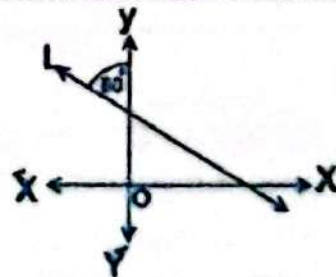
[Q3] [A] Choose the correct answer:

(1) If $\tan \theta = \frac{\sin 70^\circ}{\cos 20^\circ}$, then $\theta = \dots\dots\dots^\circ$

- a) 20 b) 45 c) 70 d) 90

(2) In the opposite figure:

The slope of straight line L =



- a) $\frac{\sqrt{3}}{3}$ b) $\sqrt{3}$ c) $-\sqrt{3}$ d) $-\frac{\sqrt{3}}{3}$

(3) If the lengths of two sides in a triangle are 3 cm , 8 cm, then the greatest integer represents the length of the third side is
Cm

- a) 5 b) 8 c) 10 d) 11

[B] If A (X , 3) , B (3 , 2) , C (5 , 1) and AB = BC

Find the value of X



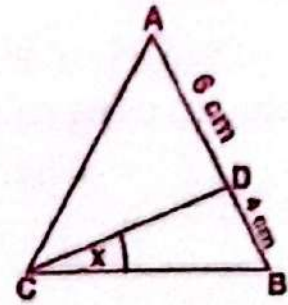
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[A] In the opposite figure:

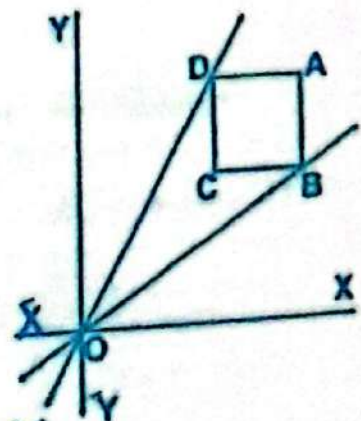
Find the value of expression: $1 + \tan^2 X$



[B] B] If the area of the triangle which is bounded by the straight lines $\frac{x}{a} + \frac{y}{b} = 1$, $X = 0$, $Y = 0$ equals 12 square units where $a > 0$, $b > 0$. Find the value of ab

[Q5]
[A] If the straight line passes through the points $(3, 1)$, $(2, K)$ is perpendicular to the straight line whose equation is $Y - X = 3$. Find the value of K .

② Equation of straight line $\overrightarrow{OD}$



End of the questions



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GEOMETRY — MODEL NO (2)
(DAKHLIA 2024)

[1] [A] Choose the correct answer:

- (1) The slope of straight line which is perpendicular to Y-axis =
a) Undefined b) Zero c) -1 d) 1
- (2) If the ratio between the measures of two complementary angles is 4 : 5 , then the measure of the smallest angle =°
a) 40 b) 50 c) 80 d) 100
- (3) If $\tan (X + 10)^\circ = \sqrt{3}$, where $(X + 10)^\circ$ is the measure of an acute angle, then the value of X =°
a) 20 b) 40 c) 50 d) 70

[B] If $\overline{AB}$ is a diameter in the circle M , If A (8 , Y) , B (X , 3) , M (5 , 7) Find the value of X + Y



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[2] [A] Choose the correct answer:

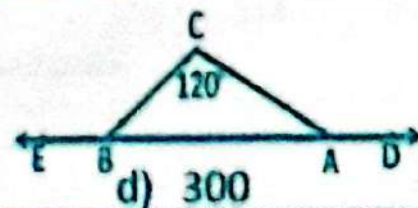
- (1) If the point C is the midpoint of $\overline{AB}$, then $(AB)^2 = \dots\dots\dots (AC)^2$
a) 4 b) 2 c) $\frac{1}{2}$ d) $\frac{1}{4}$

(2) In the opposite figure:

If $m(\angle C) = 120^\circ$

Then $m(\angle DAC) + m(\angle EBC) = \dots\dots^\circ$

- a) 60 b) 180 c) 240



d) 300

- (3) The area of the triangle which is bounded by the straight lines $X = 0$, $Y = 0$, $\frac{x}{3} - \frac{y}{4} = 1$ equalssquare units
a) -6 b) 6 c) 7 d) 12



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[B] ABCD is a rhombus in which A (5 , 3) , B (6 , - 2) , C (1 , m)
Find the value of m?

[3] [A] Choose the correct answer:

(1) If ABCD is a parallelogram, then $\sin \left(\frac{a+b}{4} \right) = \dots$

- a) $\frac{1}{2}$ b) $\frac{\sqrt{2}}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\sqrt{2}$

(2) ABCD is a rhombus in which A (7 , 1) , B (1 , 9) , then the perimeter of the rhombus equals unit length

- a) 10 b) 14 c) 40 d) 100

(3) If 5 cm, 9 cm, X cm are sides lengths of a triangle, then X may be equal

- a) 4 b) 10 c) 14 d) 18

[B] If the distance between two points (X , 5) and (6 , 1) equals $2\sqrt{5}$ length units, find the values of X.

[4]

[A] ΔXYZ is right at Y, XY = 9 cm, XZ = 15 cm
Find the value of: $\cos^2 Z - \cos^2 X$



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- [B] If the straight line passes through the two points $A(4, 3)$, $B(-2, -3)$ is parallel to the straight line whose equation is: $(2K + 1)X - KY + 7 = 0$. Find the value of K



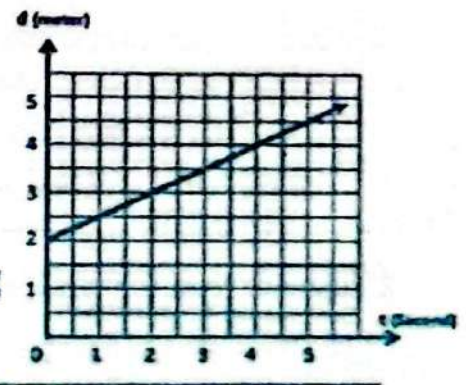
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[5]

- [A] The opposite graph represents the motion Of a particle moving with uniform velocity (v) Where the distance (d) is measured in meter And the time (t) in seconds

Find:

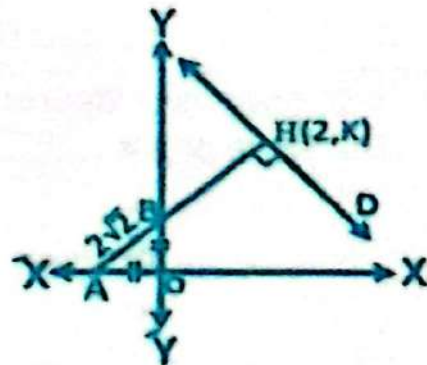
- ① The distance at the beginning of the motion
- ② The velocity of the particle
- ③ The equation of the straight line representing The motion of the particle



[B] In the opposite figure:

O is the origin point, $OA = OB$,
 $AB = 2\sqrt{2}$ length unit, if the coordinate
Of point $H(2, K)$, $\overline{AB} \perp \overline{CD}$.

- Find:
- ① The value of K
 - ② The Equation of $\overline{HD}$



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End of the questions



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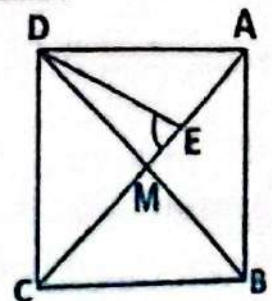
GEOMETRY – MODEL NO (3)
(DAKAHLIA 2023)

[1] A) Choose the correct answer:

- (1) The distance between the point (3,4) and the line $Y=2$ equals....
a) 2 units b) 3 units c) 4 units d) 5 units
- (2) The perimeter of triangle which is bounded by the lines $X = 0$, $Y = 0$, $4X + 3Y = 12$ equals length units
a) 6 b) 12 c) 30 d) 60
- (3) If $\tan (x+10) = \sqrt{3}$, where $(x+10)$ is an acute angle, then $X = \dots$
a) 20 b) 40 c) 50 d) 70

[B] In the opposite figure:

ABCD is square its diagonals intersect at M
 $E \in \overline{AC}$, $CE = 5$ cm , $AE = 3$ cm
Find: $\tan (\angle DEC)$

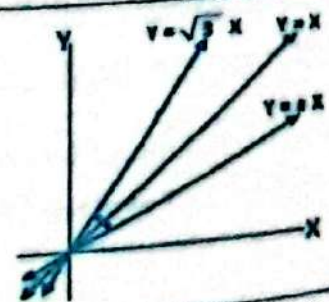


[02] Choose the correct answer:

- (1) The slope of straight line which makes with positive direction of X-axis an acute angle of measure θ equals
a) $\sin \theta$ b) $\cos \theta$ c) $\frac{\sin \theta}{\cos \theta}$ d) $\frac{\cos \theta}{\sin \theta}$

- (2) In the opposite figure:
The value of $a = \dots\dots\dots$

- a) $\frac{1}{\sqrt{3}}$ b) $\frac{1}{\sqrt{2}}$
c) $\sqrt{2}$ d) $\sqrt{3}$



- (3) The slope of straight line whose equation $3Y = KX - 5$ and passing through point $(20, 5)$ is
a) 1 b) -1 c) -2 d) $\frac{1}{3}$

- [8] Find the equation of straight line passing through $(3, -5)$ and parallel to line $X + 2Y - 7 = 0$

[3] Choose the correct answer:

- (1) If two straight lines $Y = AX + B$, $Y = CX + D$ are perpendicular, then = -1 □

a) $a \times d$ b) $a \times c$ c) $b \times c$ d) $b \times d$

- (2) A circle its center is origin point and its radius 2 units, which of the following points belong to the circle?

a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

- (3) In $\triangle ABC$, if $\tan A = 2 + \sqrt{3}$, $\tan B = 2 - \sqrt{3}$, then $m(\angle C) = \dots^\circ$

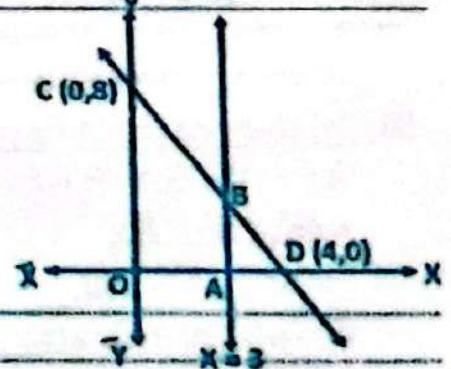
a) 60 b) 90 c) 100 d) 120

[B] In the opposite figure:

O is an origin point, $C(0, 8)$, $D(4, 0)$

$AB \cap CD = \{B\}$.

Find area of figure ABCO



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[4]

[A] If the point A (X , 7) lies on the circle which its center N (-2,3) and its radius 5 units . Find the value of X ?

ABC is a triangle right at B, prove that: $\sin A + \sin C > 1$

[5]

[A] If $2 \cos X = \tan 60^\circ \tan 45^\circ$ where X is acute angle,
Find: $\tan 2X$



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[B] In the opposite figure:

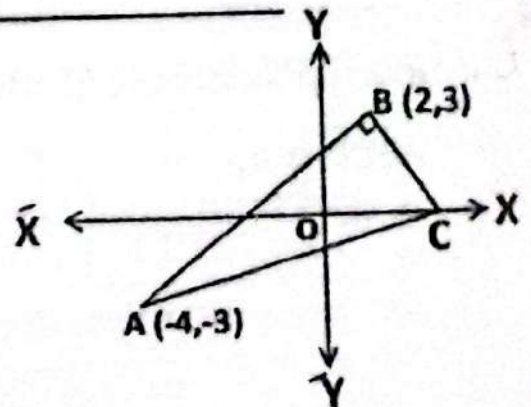
A (-4 , -3) , B (2 , 3)

And $\overline{AB} \perp \overline{BC}$

Find:

① The Coordinates of point C

② The equation of $\overline{AC}$



End of the questions

GEOMETRY – MODEL No (4)

[1] A) Choose the correct answer:(1) The slope of two parallel lines are $\frac{-3}{2}$, $\frac{6}{k}$, then $k = \dots\dots\dots$

- a) $\frac{3}{2}$ b) 2 c) 6 d) -4

(2) In ΔABC right at B, then $\sin A + \cos C = \dots\dots\dots$

- a) $2 \sin A$ b) $2 \sin C$ c) $2 \sin B$ d) $2 \cos A$

(3) If the slope of straight line is more than zero, then the angle in which the straight line makes with positive direction of X-axis is $\dots\dots\dots$ angle

- a) Zero b) Acute c) Right d) Obtuse

[B] Find the equation of straight line passing through point $(-1,3)$ and its slope is positive and cut two equal parts from the two coordinate axes.[2] Choose the correct answer:(1) ABCD is square, $A(3,5)$, $C(5,-1)$, then the slope of $\overrightarrow{BD}$ equals ...

- a) $\frac{3}{4}$ b) $\frac{1}{3}$ c) -6 d) -3

(2) ABCD is a rhombus, $A(-1,7)$, $B(-3,1)$, then its perimeter $\dots\dots\dots$

- a) $\sqrt{10}$ b) $2\sqrt{10}$ c) $3\sqrt{10}$ d) $4\sqrt{10}$

(3) ΔABC right at B, area of $\Delta ABC = \frac{1}{2} (BC)^2$, then $\tan A = \dots\dots\dots$

- a) 1 b) $\sqrt{3}$ c) $\frac{1}{\sqrt{3}}$ d) $\frac{1}{2}$



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[B] Find the equation of axis of symmetry of $\overline{AB}$, $A(3, -2)$, $B(-5, 6)$

[3] [A] Choose the correct answer:

(1) ABCD is a rhombus, $A(3, 3)$, $C(-3, -3)$ then slope of $\overline{DB} = \dots$

- a) -1 b) 1 c) $\frac{1}{3}$ d) $-\frac{1}{3}$

(2) $\tan 75^\circ = \dots$

- a) $\frac{\cos 75^\circ}{\sin 75^\circ}$ b) $\frac{\sin 75^\circ}{\cos 75^\circ}$ c) $2\tan 25^\circ$ d) $\frac{2\sin 25^\circ \cos 25^\circ}{5^\circ}$

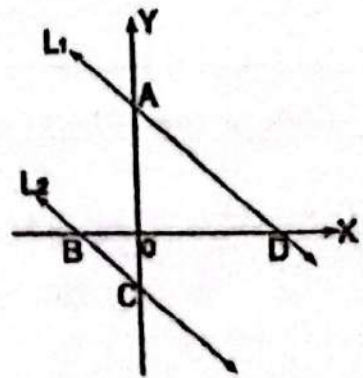
(3) The equation of straight line parallel to X-axis and passing through $(5, 3)$ is

- a) $X = 3$ b) $X = 5$ c) $Y = 3$ d) $Y = 5$

[B] In the opposite figure:

$L_1 \parallel L_2$, where equation of $L_1 : Y = 5 - X$,
And L_1 cut the two axes at the points D, A
And L_2 cut the two axes at the points B, C
Where $AC = 7$ length units. Find:

- 1) Coordinate of points B, C
- 2) Equation of the straight line L_2



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[4]

[A] ABCD is a rectangle, $A(1, 1)$, $B(3, 3)$, $C(0, -3)$, $D(X, Y)$.
Find the value of X, Y

[B] If triangle ABC is right at B, $7 \tan A - 24 = 0$
find the value of $1 - \tan A \tan C$

[5]

[A] If ΔABC is right at B, $\tan A + \tan C = \frac{25}{12}$,
Find: $\tan^2 A + \tan^2 C$

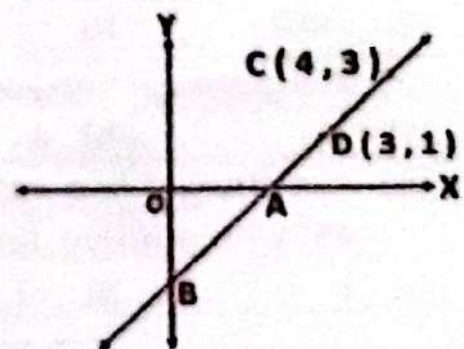
[B] In the opposite figure:

$\overline{AB}$ Passing through $C(3, 4)$, $D(3, 1)$

And cut X-axis at point A

And cut Y-axis at point B

Find the lengths of each $\overline{OA}$, $\overline{OB}$



.....
End of the questions



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GEOMETRY – MODEL NO (5)

[1] A) Choose the correct answer:

(1) If the point (4 , 6) lies on the straight line whose equation $Y = X \sin 30^\circ + K$, then $K = \dots\dots\dots$

- a) 2 b) 4 c) 6 d) 8

(2) If $\sin (x+5) = \frac{1}{2}$, where $(x+5)$ is acute angle, then $\tan (x+20) = \dots$

- a) $\frac{\sqrt{2}}{2}$ b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) 1

(3) If the straight line $Y = C X + 5$ parallel to X-axis, then $C = \dots$

- a) Zero b) 1 c) 2 d) 3

[B] If the point $(-3, K)$ is midpoint of $\overline{AB}$, $A(m, -6)$, $B(9, -12)$.

Find $K-m$



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[2] Choose the correct answer:

(1) In $\triangle ABC$, if $m(\angle A) : m(\angle B) : m(\angle C) = 3 : 4 : 5$, then $\cos B = \dots\dots\dots$

- a) Zero b) $\frac{1}{2}$ c) 1 d) $\frac{\sqrt{3}}{2}$

(2) The distance between $(4, 3)$ and line $Y = 2$ equals $\dots\dots\dots$ units

- a) 3 b) 4 c) 5 d) 6

(3) The straight line passing through $(1, y)$, $(4, 3)$ makes angle 45° with positive direction of X-axis, then $Y = \dots\dots\dots$

- a) 1 b) -1 c) Zero d) 4

- [B] ΔABC , A (3,2) , B (4,-5) , C (0,-3), $\overline{AD}$ is median.
 Find the equation of $\overline{AD}$

[3]

[A] Choose the correct answer:

- (1) The equation of straight line whose slope is equal to the additive identity is parallel to straight line its equation is
- a) $Y = X$ b) $Y = 1$ c) $X = 1$ d) $Y = -X$
- (2) If the X-axis bisects $\overline{AB}$, A(3,2) , B(-2,Y), then $Y = \dots\dots\dots$
- a) 3 b) 2 c) -2 d) 4
- (3) The slopes of two perpendicular lines are $-\frac{1}{4}$, $4k$, then $K = \dots$
- a) $\frac{1}{4}$ b) 1 c) -4 d) 4

- [B] Prove that the points A(6 , 0) , B (2 , - 4) , C (- 4 , 2) are vertices of a right- angled triangle at B, then find coordinate of point D which make the figure ABCD is a rectangle?



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[4] [A] In the opposite figure:

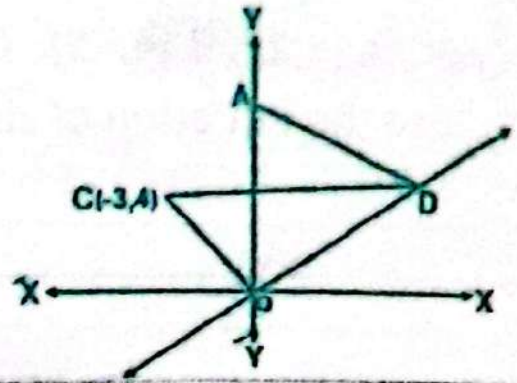
Equation Of $\overline{OD}$ is $Y = 2X$

Coordinate of C $(-3, 4)$

Area of $\triangle AOD$ = area of $\triangle COD$

Find coordinate of point A

Then find the equation of $\overline{AC}$

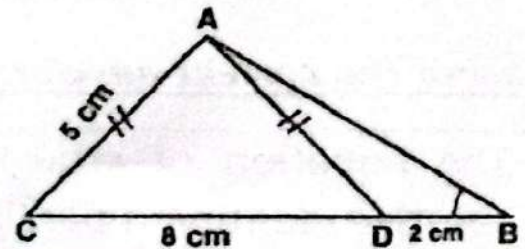


[B] In the opposite figure:

$\triangle ABC$, $D \in AC$, $AD = AC = 5$ cm,

$BD = 2$ cm, $CD = 8$ cm

Prove that: $\sin^2 B + \cos^2 C$



[5] [A] $\triangle ABC$ is an isosceles triangle, $AB = AC$, $\sin \frac{a}{2} = \frac{4}{5}$

Without using calculator find $\cos B$

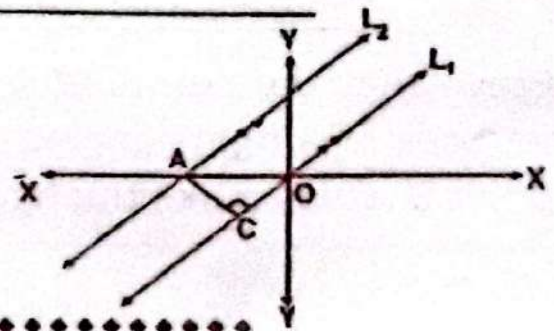
[B] In the opposite figure:

Equation of L_1 is $Y = X$

$L_1 \parallel L_2$, $\overline{AC} \perp L_1$,

$AC = 3\sqrt{2}$ length units

Find equation of L_2



End of the questions



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GEOMETRY – MODEL No (6)

[1] A) Choose the correct answer:

(1) The distant between $(L, -4)$ and Y-axis is units, $L \in \mathbb{R}$

- a) 4 b) L c) -4 d) $|L|$

(2) If $\sin X = 2 \cos 60 \sin 30$, X is an acute angle, then $X = \dots\dots\dots$

- a) 30 b) 60 c) 45 d) 75

(3) If the two lines $3X - 4Y - 3 = 0$, $3X + KY - 8 = 0$ are perpendicular, then $K = \dots\dots\dots$

- a) -4 b) -3 c) 3 d) 4

[B] ABCD is a rhombus, $A(1, 3)$, $C(7, 9)$. Find equation of $\overline{BD}$ 

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[2] [A] Choose the correct answer:

(1) A circle its center is origin point, its radius is 2 units, which of the following points lies on the circle?

- a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

(2) $\triangle ABC$ is right at B, $3AC = 5BC$, then $\tan A = \dots\dots\dots$

- a) $\frac{3}{5}$ b) $\frac{5}{3}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$

(3) The equation $2X - 3Y - 6 = 0$ cut from Y-axis part ofunits

- a) -6 b) -2 c) $\frac{2}{3}$ d) 2



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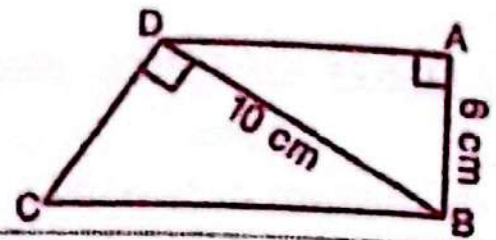
[B] In the opposite figure:

ABCD is a trapezium right at A

$\overline{AD} \parallel \overline{BC}$, $AB = 6 \text{ cm}$, $BD = 10 \text{ cm}$

Find: ① $\tan (\angle ADB)$

② Length of $\overline{DC}$



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[3] [A] Choose the correct answer:

(1) If the slope of straight line passing through $(1, Y)$, $(3, 4)$ equals $\tan 45^\circ$, then $Y = \dots\dots\dots$

- a) 1 b) 2 c) -1 d) 4

(2) In $\triangle ABC$, $m(\angle A) = 85^\circ$, $\sin B = \cos B$, $m(\angle C) = \dots\dots\dots^\circ$

- a) 30 b) 45 c) 50 d) 60

(3) The radius length of a circle its center is origin point and passes through the point $(3, 4)$ is $\dots\dots\dots$ units

- a) 7 b) 1 c) 12 d) 5

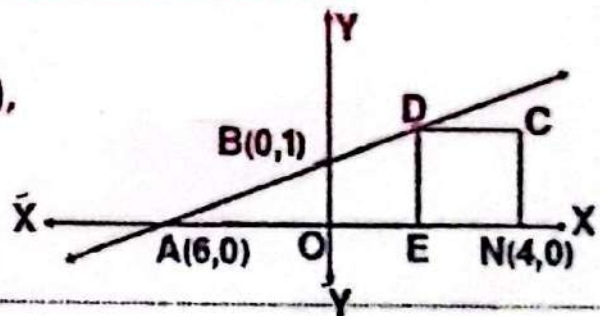
[B] $\triangle ABC$, $A(1, 1)$, $B(3, 1)$, $C(1, 3)$. Prove that $\triangle ABC$ is an isosceles triangle, then find the equation of axis of symmetry of $\triangle ABC$

[4]

[A] The wind broke the upper point of a tree to make 60° angle with the ground level, if the top of the tree meets the ground 4 meters away from the bottom of the tree. Find the height of the tree to the nearest meter.

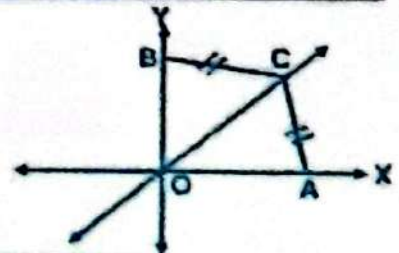
[B] In the opposite figure:

AB passing through $A(-6,0)$, $B(0,1)$,
 DENC is square, $N(4,0)$
 Find area of square DENC



[5] [A] In the opposite figure:

$AO = 4$ units, $BO = 6$ units
 Equation of OC is $Y = X$, $AC = BC$
 Find the length of OC

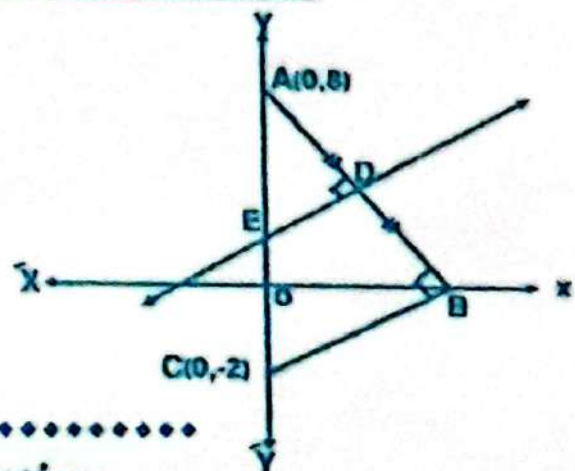


[B] In the opposite figure:

$\overline{AB} \perp \overline{BC}$, $A(0,8)$, $C(0,-2)$
 $\overline{DE} \perp \overline{AB}$, D midpoint of $\overline{AB}$
 $E \in Y$ -axis, $B \in X$ -axis

Find:

- ① Coordinate of point B
- ② Equation of $\overline{DE}$



End of the questions



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امتحانات رقم (3)

الترم الاول



ALGEBRA – MODEL NO 1**[Q1] A) Choose the correct answer:**

(1) 30 % of 600 =

- a) 1.8 b) 18 c) 180 d) 1800

(2) If $(X + 1, 2) = (5, Y - 3)$, then $\sqrt{X + Y} = \dots\dots\dots$

- a) 2 b) 3 c) 6 d) 9

(3) If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots$

- a) 8 b) 9 c) 11 d) 12

[B] If a, b, c, d are in continued proportion prove that :

$$\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$$

[Q2] Choose the correct answer:(1) The range of the values: $X + 4, X - 3, X + 8$, where X is a real number is

- a) 1 b) 4 c) 7 d) 11

(2) If $a, 5, b, 7$ are proportion quantities, then $\frac{a}{b} = \dots\dots\dots$

- a)
- $\frac{5}{7}$
- b)
- $\frac{7}{5}$
- c) 5 d) 7

(3) If the real-length is 6 m, length-in drawing is 6 cm, then the drawing scale is

- a) 1 : 1 b) 1 : 10 c) 1 : 100 d) 1 : 1000

[B] If $X \times Y = \{(3, 2), (1, 2), (2, 4), (3, 4), (1, 4), (2, 2)\}$

Find:

① X, Y

② $(X - Y) \times (X \cap Y)$

[Q3] [A] If $X = \{1, 3, 4, 5\}$, $Y = \{1, 2, 3, 4, 5, 6\}$ and $\mathcal{R}$ is relation from X to Y where $a \mathcal{R} b$ means " $a + b = 7$ " for $a \in X, b \in Y$.

- ① Write $\mathcal{R}$ and represents it with arrow diagram.
- ② Show that if $\mathcal{R}$ is function or not? and why? if it is function find its range.

[B] If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{2}{3}$, and $5a - 3c + e = 18$.

Find the value of: $5b - 3d + f$

[Q4] [A] If $\mathcal{F}: \mathcal{F}(x) = KX^2 + (3K + 2)X + 6$, and X - coordinate of the vertex of the curve is -2 , find:

- ① The value of K
- ② Minimum or Maximum value of function $\mathcal{F}$

[B] If the number of hours (n) needed for carrying out a work varies inversely as the number of workers (X) who carry out this work.
If the work is carried out by 6 workers within 4 hours, what is the needed time for carrying out the work by 8 workers?

[Q5] [A] Calculate the standard deviation of the values:

12, 13, 16, 18, 21

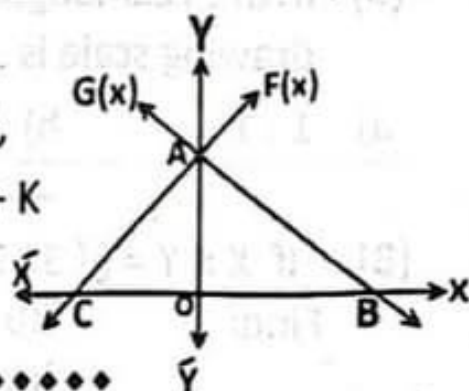
[B] In the opposite figure:

$\overline{AC}$ Represents the linear function $\mathcal{F}(x) = X + 3$,

$\overline{AB}$ Represents the linear function $\mathcal{G}(x) = mX + K$

If Length of $\overline{BC} = 7$ length units, find:

- ① Value of K, m
- ② $\mathcal{G}(8)$



ALGEBRA — MODEL NO (2)

[Q1] A) Choose the correct answer:

(1) If $\{3, 6\} = \{x + 1, 3\}$ then $x = \dots\dots\dots$

- a) 2 b) 3 c) 4 d) 5

(2) If $y \propto x$ and $y = 2$ when $x = 6$, then $y = \dots\dots\dots$ when $x = 2$

- a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{2}$ d) 3

(3) If the range of set of the values is 9 and the highest value is 15, then the lowest value is $\dots\dots\dots$

- a) 24 b) 18 c) 6 d) 3

[B] If $X - Y = \{3\}$, $Y - X = \{1, 5\}$, $X \cap Y = \{6\}$

Find :1) X, Y 2) $(X \cap Y) \times X$

[Q2] Choose the correct answer:

(1) 27 months : 3 years = $\dots\dots\dots$: $\dots\dots\dots$ in the simplest form

- a) 9 : 1 b) 1 : 9 c) 3 : 4 d) 9 : 10

(2) The S.S. of the $\sqrt{x^2} = 4$ in R

- a) $\{2, -2\}$ b) $\{4, 4\}$ c) $\{16, -16\}$ d) $\{4\}$

(3) If $X = [-4, 2]$, $Y = [-2, 5]$, then $(3, -3) \in \dots\dots\dots$

- a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2

[B] If a, b, c, d are in continued proportional . Prove that:

$$\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$$

[03] [A] If $f(x) = x^2 - 3x$, $g(x) = x - 3$ Find:

① $f(\sqrt{2}) + 3g(\sqrt{2})$

② All values of x which make $f(x) = g(x)$

[B] If $X = \{-1, 0, \frac{1}{2}, 2\}$ and R is a relation on X where $a R b$ means " a is the multiplicative inverse of b " for each of $a \in X$, $b \in X$. write R and show with reason if R is a function or not ?

[04] [A] If $y = a - 9$ and $y \propto \frac{1}{x^2}$ and $a = 18$ when $x = \frac{3}{2}$ Find:

① the relation between y and x

② the value of y when $x = 1$

[B] Through the interest of the Egyptian authorities with the villages, If the ratio between lengths of two roads is $2 : 5$, and the difference between them is 21 Km.

① Calculate the length of them in kilometer.

② If the cost of paving 1 Km. is 2 million Egyptian pounds, find the total cost of paving the two roads?

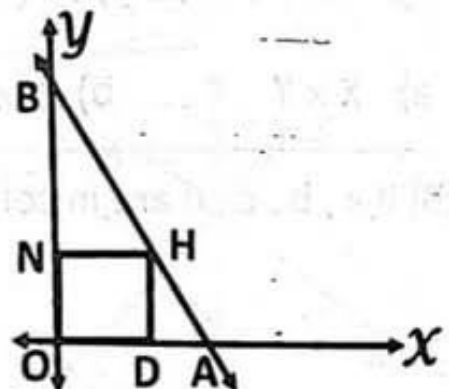
[05] [A] Calculate the standard deviation of the set of values:
5, 6, 7, 8 and 9

[B] In the opposite figure:

The linear function f where: $f(x) = kx + m$ represent graphically by straight line $\overline{AB}$ where $A(3,0)$, $B(0,6)$, $ONHD$ is square

① Write the rule of function f ?

② Find the area of square $ONHD$?



.....
End of the questions

ALGEBRA – MODEL No (3)**[Q1] A) Choose the correct answer:**

(1) The difference between smallest and greatest some of values is called

- a) Range b) Mode c) Mean d) Standard deviation

(2) If X, Y are two sets where $X \subset Y, Y = \{0,1,2\}$, then $n(X \times Y) \in \dots$

- a) $\{0, 3\}$ b) $\{0, 3, 6\}$ c) $\{3, 6, 9\}$ d) $\{0, 3, 6, 9\}$

(3) If F is polynomial function of second degree, $F(K-5) = F(3-K)$, then the equation of axis of symmetry of curve of function is ...

- a) $X = 1$ b) $X = -1$ c) $Y = 1$ d) $Y = -1$

[B]. If a, b, c are in continued proportion, prove that:

$$\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{12}{c}$$

[Q2] Choose the correct answer:

(1) If $\frac{a}{5} = \frac{b}{7}$, then $\frac{a+b}{60} = \frac{a}{\dots}$

- a) 5 b) 10 c) 15 d) 25

(2) If $XY = 3$, then $Y \propto \dots$

- a) X b) $3X$ c) $\frac{1}{x}$ d) $\frac{1}{3} X$

(3) If a, b, c are proportion quantities, $\frac{a}{c} = \dots$

- a) $\frac{c^2}{b^2}$ b) $\frac{b^2}{c^2}$ c) $\frac{b^2}{a^2}$ d) $(bc)^2$

[B] Calculate the mean and the standard deviation for the following data: 8, 9, 7, 6, 5

[03]

[A] if $X = \{2, 3, 4\}$, $Y = \{Y : Y \in \mathbb{N}, 2 \leq Y \leq 9\}$ where $\mathbb{N}$ is set of natural number and R is relation from X to Y where $a \mathcal{R} b$ means $((a = \frac{1}{2}b))$ for each $a \in X, b \in Y$, find R and represents it by arrow diagram, then show that $\mathcal{R}$ is function from X to Y and find its range.

[B] If $\frac{x+y}{11} = \frac{y+z}{9} = \frac{z+x}{4}$ prove that: $\frac{x+y+z}{5x+4y+3z} = \frac{6}{25}$

[04]

[A] IF $\mathcal{F}(x) = (a-2)x^2 + (b+3)x + c-2$ is polynomial function of zero degree and its range $\{5\}$. Find $a+b+c$

[B] If a, b, c, d are positive quantities and $\frac{a^2-2c^2}{b^2-2d^2} = \frac{a^2}{b^2}$
Prove that: a, b, c, d are proportional quantities

[05]

[A] If $Y = 3 + a$ and $a \propto \frac{1}{x}$ and $Y = 5$ when $X = 1$

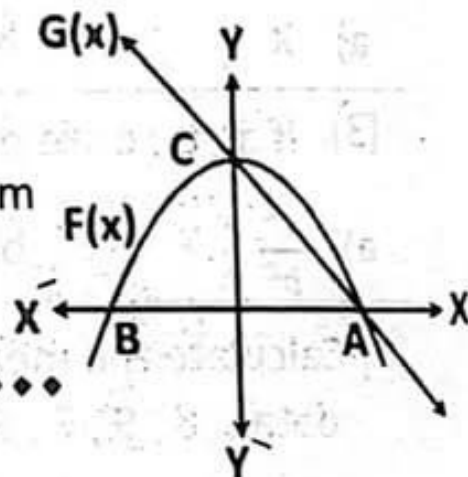
- ① Find the relation between X, Y
- ② Find the value of Y when $X = 2$

[B] In the opposite figure:

The curve represents $F(x) = 4 - x^2$,

$\overline{AC}$ Represents the linear function $G(x) = KX + m$

- ① Find the value of K, m
- ② $F(1) + G(1)$



.....
End of the questions

ALGEBRA – MODEL NO (4)**[01] A) Choose the correct answer:**

(1) If $a < 0$, $b > 0$, then the point $(2^a, 3^b)$ lies in the quadrant

- a) First b) Second c) Third d) Fourth

(2) If 4, 6, K are proportional quantities, then $K = \dots\dots\dots$

- a) 10 b) 9 c) 2 d) 24

(3) If $F(x) = X - 5$ and $\frac{1}{2} F(a) = 3$, then $a = \dots\dots\dots$

- a) 2 b) 8 c) 11 d) 16

[B] If $X^4 Y^2 - 14 X^2 Y + 49 = 0$

Prove that: $Y \propto \frac{1}{x^2}$

[02] Choose the correct answer:

(1) If $F(x) = aX + b$, and $F(a) = b$, then $\sqrt{9 - ab} = \dots\dots$

- a) Zero b) 3 c) -3 d) ± 3

(2) If $n(x) = K + 3$, $n(Y) = K - 3$, $n(X \times Y) = 16$, then $K = \dots\dots$

- a) 5 b) -5 c) ± 5 d) 25

(3) If $Y \propto X$, and $Y = 5$ when $X = 3$, then the variation constant =

- a) 15 b) 5 c) 3 d) $\frac{5}{3}$

[B] If $\frac{a}{b} = \frac{c}{d} = \frac{e}{x} = \frac{3}{2}$, $2a + c - 3e = 18$, $2b + d = 15$

Find the value of X?

[A] If $X = \{-3, -2, -1, 0, 1, 2, 3\}$, $Y = [0, 9[$ and R is relation from X to Y where $a \mathcal{R} b$ means $((a^2 = b))$ for each $a \in X, b \in Y$, find R and represents it by arrow diagram, then show that $\mathcal{R}$ is function from X to Y or not? With reason.

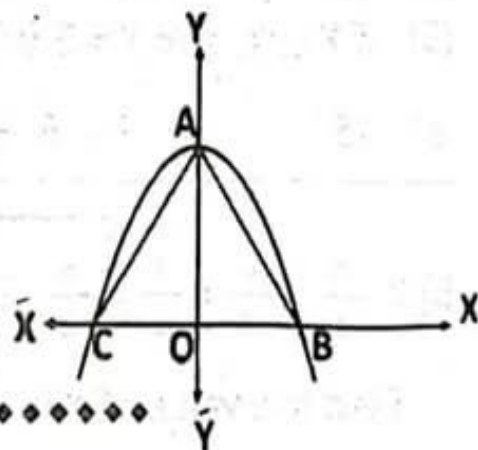
[B] If $\frac{a}{b+c} = \frac{1}{3}$, $\frac{c}{a+b} = \frac{5}{7}$ Find the value of: $\frac{b}{a+c}$

[A] If $F(x) = a + X^2$, $L(x) = C$ are two polynomial function where a, c are constant and $3 F(2) + 3 L(x) = 6$
Find the numerical value of $2 F(0) + 2 L(7)$

[B] Calculate the standard deviation for the following values:
65, 61, 70, 64, 70, 76, 70

[A] A car is moved with constant speed where the travelled distance is directly variation with the time, if the car travelled 150 Km in 6 hours, how many kilometers the car travelled in 10 hours

② Find area of $\triangle ABC$



End of the questions

ALGEBRA – MODEL NO (5)

[Q1] A) Choose the correct answer:

(1) The simplest measure of dispersions is

- a) Range b) Mode c) Mean d) Standard deviation

(2) Which of the following represents inversely variation between X, Y is

- a) $Y = X$ b) $Y = X^2$ c) $XY^2 = 1$ d) $Y = \frac{3}{x}$

(3) If $X^2 = \{ (3K - 4, K) \}$, $Y = \{ 1, 7 \}$ which of the following ordered pair belongs to Cartesian product $X \times Y$?

- a) $(4, 1)$ b) $(3, 1)$ c) $(2, 1)$ d) $(3, 7)$

[B] Calculate the mean and standard deviation for the following values: 5, 16, 20, 27, 32

[Q2] Choose the correct answer:

(1) If $F(x) = 3X + 5$, and $m + n = 9$, then $F(m) + F(n) = \dots$

- a) 14 b) 27 c) 32 d) 37

(2) If 2 is mean proportion between a, b , then the positive mean proportion between $(a + \frac{1}{b}) (b + \frac{1}{a})$ is

- a) 6 b) 4 c) 6.25 d) 2.5

(3) If $F: F(x) = (n - 3)X^2 + 5$ has maximum value, then $n \in \dots$

- a) $]3, \infty[$ b) $] -\infty, 3[$ c) $\{3, 5\}$ d) $]5, \infty[$

[B] IF $\frac{x+y}{19} = \frac{y+z}{7}$ Prove that: $\frac{x-z}{x+2y+z} = \frac{6}{13}$

[03]

- [A] If $X = \{1, 4, 7\}$, $Y = \{-1, 1, 4, 7\}$ and $\mathcal{R}$ is relation from X to Y where $a \mathcal{R} b$ means $((a + |b| = 8))$ for each $a \in X$, $b \in Y$, find $\mathcal{R}$ and represents it by arrow diagram, then show that $\mathcal{R}$ is function from X to Y or not? With reason.

- [B] If $\frac{a}{b} = \frac{2}{3}$, $\frac{a}{c} = \frac{3}{5}$, $a + b + c = 75$, find the value of a , b , c

[04]

- [A] If $F(x) = 5x - K$, $G(x) = x - 2K$ where K is constant
And $F(1) + G(3) = -7$, find $F(3) + G(1)$

- [B] If $Y = 3 + Z$, $Z \propto \frac{1}{x}$, find the relation between X , Y where $Y = 5$ at $X = 1$. Then find Y when $X = 2$

[05]

- [A] If $\frac{21x-y}{7x-z} = \frac{y}{z}$, prove that Y directly variation with Z , $X \neq 0$

- [B] In the opposite figure:

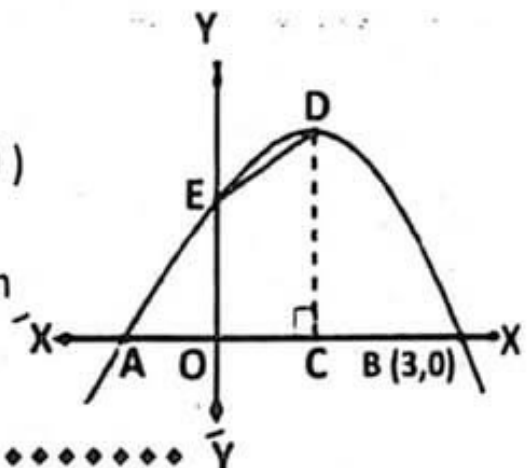
The curve represents the curve
of $F(x) = -x^2 + 2x + K - 1$

Where D is vertex of the curve, $B(3, 0)$

Find: ① Value of K

② Maximum value of the function

③ Area of the figure DCOE



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End of the questions

ALGEBRA – MODEL NO (6)

[Q1] A) Choose the correct answer:

(1) If the point (X, Y) lies in the third quadrant, then the point (X^3, Y^2) lies in the quadrant

- a) First b) Second c) Third d) Fourth

(2) If $5X = 9Y$, then $\frac{3X}{2Y} = \dots\dots\dots$

- a) $\frac{27}{10}$ b) $\frac{9}{5}$ c) $\frac{5}{9}$ d) $\frac{81}{25}$

(3) If X, Y are two sets, $n(X \times Y) = 5$, then $n(X) - n(Y) = \dots\dots\dots$

- a) 4 b) Zero c) -4 d) ± 4

[B] Calculate the mean and standard deviation for the following values: 8, 9, 7, 6, 5

[Q2] Choose the correct answer:

(1) If $(a, 4)$ one of the points of function $F: \mathbb{R} \rightarrow \mathbb{R}$, $F(x) = 2X + b$, then $6a + 3b = \dots\dots\dots$

- a) 12 b) 9 c) 6 d) 3

(2) If 2, 6, $x + 15$ are proportional, then $X = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) $-\frac{3}{2}$

(3) If $XY^5 = \text{constant}$, then X inversely variation with....

- a) $\frac{1}{5}$ b) Y^5 c) Y d) Y^2

[B] IF $a + b : b + c : c + a = 6 : 7 : 8$, $a + b + c = 14$

Find the value of c ?

[03]

[A] If $X = \{-2, 2, 5\}$, $Y = \{3, 7, K\}$ and $\mathcal{R}$ is function from X to Y where $a \mathcal{R} b$ means $((b = a^2 - 1))$ for each $a \in X$, $b \in Y$, find the value of K and represent the function by arrow diagram.

[B] If a, b, c, d are in continued proportion, prove that:

$$\frac{a}{b^2 c^2} + \frac{b}{c^2 a^2} + \frac{c}{a^2 b^2} = \frac{1}{a^3} + \frac{1}{b^3} + \frac{1}{c^3}$$

[04]

[A] If $F: F(x) = (m - 3)x^2 + (2 - K)x + 2K + 3m$ is polynomial function of first degree, if $F(1) = 12$, find the value of K, m

[B] IF $X = Z + 8$, and Z inversely variation with Y , and $Z = 2$ when $Y = 3$, find the relation between X, Y and find the value of Y at $X = 3$

[05]

[A] If $2a = 3b = 4c$, find the numerical value of the expression:

$$\frac{a^2 + b^2 + c^2}{a(b + c)}$$

[B] In the opposite figure:

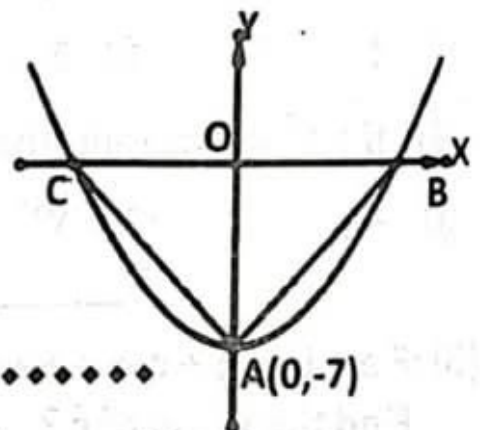
The curve of $F(x) = Lx^2 - 7$,

Area of $\triangle ABC = 21$ square units

$A(0, -7)$.

① Find the coordinate of point B, C

② Find the value of L



.....
End of the questions

ALGEBRA – MODEL No (7)**[Q1] A) Choose the correct answer:**

(1) If all values are equal, then

- a) $X - \bar{X} > 0$ b) $X - \bar{X} < 0$ c) $\sigma = 0$ d) $\bar{X} = 0$

(2) IF the point $(X - 4, 2 - X)$ lies in the third quadrant, then $X \in \dots$

- a) $[2, 4]$ b) $]2, 4[$ c) $[-4, -2]$ d) $] -4, -2[$

(3) If $\frac{y+3}{y} = \frac{x+2}{x}$, where $X \neq Y \neq 0$, then

- a) $Y \propto X$ b) $Y \propto \frac{1}{x}$ c) $Y \propto X + 2$ d) $Y \propto X + 5$

[B] Calculate the mean and standard deviation for the following values:
73, 54, 62, 71, 60

[Q2] Choose the correct answer:(1) If the straight line $X = 2$ is axis of symmetry of the curve of function $F: F(x) = X^2 + KX + 4$, then $K = \dots$

- a) -4 b) -2 c) 2 d) 4

(2) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then $\frac{a}{d} = \dots$

- a) 2 b) 4 c) 8 d) 16

(3) If $X \subset Y$, then $n[(X - Y) \times Y] = \dots$

- a) Zero b) 1 c) 2 d) 3

[B] IF $bc + ab + ac = abc$, find the value of:

$$\frac{b+c}{bc(a-1)} + \frac{a+c}{ac(b-1)} + \frac{a+b}{ab(c-1)}$$

[03]

- [A] IF $X = \{-2, -1, 0, 1, 2\}$ and R is relation on X where $a R b$ means $((a + b = \text{zero}))$ for each $a \in X, b \in Y$. write R and represents it with arrow diagram and show that R is function or not?
-

- [B] If positive quantities $5a, 6b, 7c, 8d$ are in continued proportion, prove that:

$$\sqrt[3]{\frac{5a}{8d}} = \sqrt{\frac{5a+6b}{7c+8d}}$$

[04]

- [A] IF $F(x) = 2X + K, G(x) = X^2 + K$ and $F(2) + G(-4) = 30$
Find $F(-2) + G(2)$
-

- [B] IF $Y = a - 1, a \propto \frac{1}{x^2}$, find the relation between x, y where $a = 4$ at $x = 2$, then find value of X at $y = 8$
-

[05]

- [A] If $\frac{21x-y}{7x-z} = \frac{y}{z}$, prove that $Y \propto Z, X \neq 0$
-

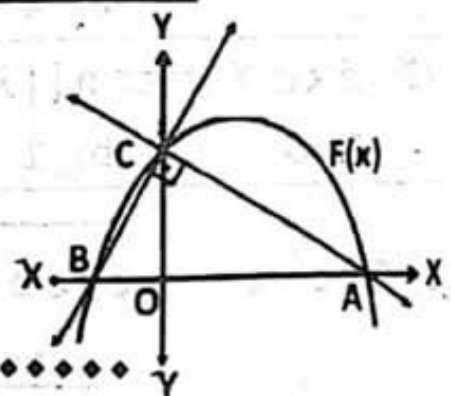
[B] In the opposite figure:

Curve of the function

$$F: F(x) = -X^2 + KX + m$$

IF $\overline{AC} \perp \overline{BC}, OC = 3 \text{ units}, OA = 9 \text{ OB}$

Find the value of K, m



.....
End of the questions

ALGEBRA – MODEL No (8)**[Q1] A) Choose the correct answer:**(1) If point A ($X - 5$, $X - 3$) lies on X – axis, then point A is

- a) (0 , 2) b) (2 , 0) c) (- 2 , 0) d) (0 , - 2)

(2) All the following functions are polynomial except $F(x) = \dots\dots\dots$

- a)
- $X + 3$
- b)
- $\sqrt{2x} + 3$
- c)
- $X(X + \frac{1}{X})$
- d)
- $X^2(X + 4)$

(3) If the range of values 7 , 3 , 6 , K , 5 is 6, then $K = \dots\dots\dots$

- a) 3 b) 6 c) 9 d) 12

[B]. If $X = \{3, 4\}$, $Y = \{4, 5\}$, $Z = \{6, 5\}$, find:

① $X \times (Y \cap Z)$

② $(X - Y) \times (Y - Z)$

[Q2] Choose the correct answer:(1) If $X = [-2, 2[$, $Y = [0, 4]$, then $(-2, -1) \in \dots\dots\dots$

- a)
- X^2
- b)
- Y^2
- c)
- $X \times Y$
- d)
- $Y \times X$

(2) If $\frac{3}{4}a = \frac{3}{2}b = 3c$, then $a : b : c = \dots\dots\dots$

- a) 3 : 4 : 2 b) 1 : 2 : 4 c) 4 : 2 : 1 d) 4 : 3 : 2

(3) Which of the following relations represents inversely variation between X , Y

- a)
- $Y = X$
- b)
- $Y = X^2$
- c)
- $XY^2 = 1$
- d)
- $Y = \frac{3}{x}$

[B] If b is middle proportion between a , c

Prove that:

$$\frac{a + b + c}{a^{-1} + b^{-1} + c^{-1}} = b^2$$

[03]

[A] If $X = \{1, 2, 4\}$, $Y = \{4, 5, 2, 7\}$ and $\mathcal{R}$ is function from X to Y where $a \mathcal{R} b$ means $((a + b = 6))$ for each $a \in X$, $b \in Y$.

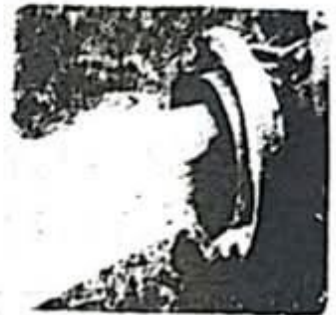
- ① Write $\mathcal{R}$ and represents it with arrow diagram
- ② Prove that $\mathcal{R}$ is a function and write its domain

[B] Calculate the standard deviation for the following values:

5, 6, 7, 8, 9

[04]

[A] If the value of speed V that water passes through a hose nozzle inversely change with square of the hose nozzle radius length r and $V = 5 \text{ m/s}$ when $r = 3$, find V when $r = 2.5 \text{ cm}$



[B] If $F(x) = ax + b$, $F(x) = b$

Find the value of $\sqrt{ab^2 + 25}$

[05]

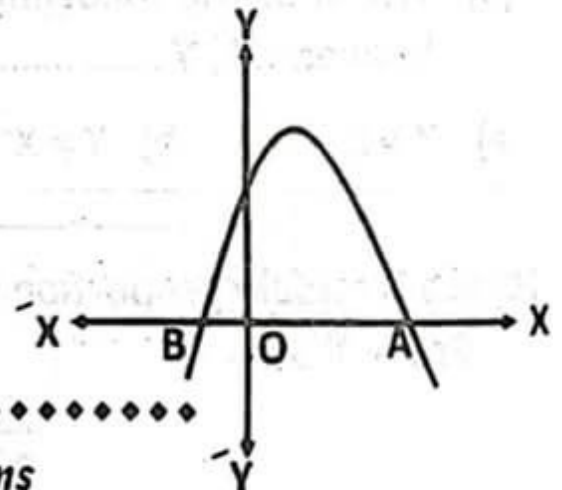
[A] If $X - Y = \frac{x+y}{7} = \frac{xy}{4}$. Find the value of: XY

[B] In the opposite figure:

The curve of $F: F(x) = -x^2 + 4x + K - 1$

If $OA = 5OB$

Find the value of K ?



.....
End of the questions

ALGEBRA – MODEL NO 9**[Q1] A) Choose the correct answer:**

(1) If $F(x) = 3$, then $6 F\left(\frac{1}{2}\right) = \dots\dots\dots$

- a) 3 b) 6 c) 9 d) 18

(2) If $(X^2 + Y^2, 3) = (10, XY)$ then $X - Y = \dots\dots\dots$

- a)
- ± 2
- b)
- ± 3
- c)
- ± 4
- d)
- ± 6

(3) If the point $(X - 2, Y + 4)$ lies on the two axes X and Y , then $X + Y = \dots\dots\dots$

- a) 2 b) -2 c) 6 d) -6

[B] IF $4a^2 + b^2 = 4ab$

① Prove that $b \propto a$ ② find value of a when $b = 8$ **[Q2] Choose the correct answer:**

(1) If $F\left(\frac{2x+1}{3x-1}\right) = 2x$, then $F(1) = \dots\dots\dots$

- a)
- $\frac{1}{2}$
- b) 1 c) 2 d) 4

(2) If $\frac{a}{b} = \frac{3}{5}$, $5a - 2b = 20$, then $b = \dots\dots\dots$

- a) 3 b) 5 c) 15 d) 20

(3) Which of the following relations represents inversely variation between $X, Y \dots\dots\dots$

- a)
- $Y = 4X$
- b)
- $Y = X + 5$
- c)
- $\frac{x}{y} = \frac{5}{7}$
- d)
- $\frac{x}{5} = \frac{2}{y}$

[B] IF $\frac{x+2y}{a+4b} = \frac{2y+5z}{4b+7c} = \frac{5z+x}{7c+a}$, prove that: $a y = 2 b x$

[A] If $X = \{-3, -2, -1, 0, 1, 2, 3\}$, $Y = [0, 9[$ and $\mathcal{R}$ is relations from X to Y where $a \mathcal{R} b$ means $((a^2 = b))$ for each $a \in X, b \in Y$.

- ① Write R and represents it with arrow diagram
- ② Prove that R is a function. (Give reason)

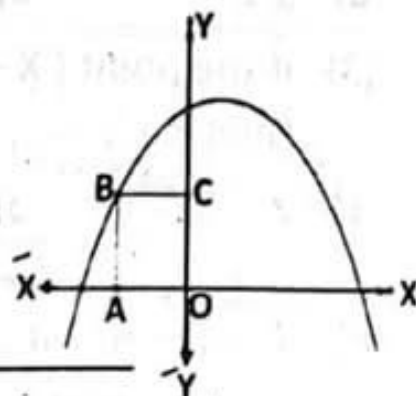
[B] If $\frac{21x+a}{7x+b} = \frac{a}{b}$, $x \neq 0$, find the value of $\frac{a+2b}{2a}$

[A] In the opposite figure:

$$F : F(x) = -x^2 - x + 5,$$

The figure OABC is square

Find the area of square OABC?



- [B] IF $Y = a + b$, where a is constant, $b \propto X$ and $Y = 3$ when $X = 0$ and $Y = 5$ when $X = 3$.

Find the relation between X , Y then find Y at $X = 7$

[A] IF $F(x) = K X^2 + (3 K + 2) X + 6$ and the X coordinate of the vertex of the curve $F(x)$ equal -2

Find the value of $F(1) + F(-1)$

- [B] The following table shows the number of excellent students in mathematics in 10 preparatory schools in Dakahlia

No. of students	4	6	8	5	Sum
Number of schools	1	2	3	4	10

Calculate the arithmetic mean and standard deviation

[illegible]

End of the questions

ALGEBRA – MODEL NO (10)**[Q1] A) Choose the correct answer:**(1) If $X = \{3\}$, then $n(X^2) = \dots\dots\dots$

- a) 1 b) 9 c) $\{(3, 3)\}$ d) $\{(3, 9)\}$

(2) If $X + Z - Y = 0$, $10X + 2Z - 5Y = 0$, then $Y : Z = \dots\dots$

- a) 5 : 8 b) 8 : 5 c) 3 : 8 d) 8 : 3

(3) If $(K^2, K) \in F$, $F(x) = 2X - 3$, then K may be equal $\dots\dots\dots$

- a) 1 b) $\frac{2}{3}$ c) $-\frac{3}{2}$ d) -1

[B] Calculate the mean and standard deviation for the following values: 8, 9, 7, 6, 5

[Q2] Choose the correct answer:(1) If $(a, 4)$ on of the points of function $F : R \rightarrow R$, $F(x) = 2X + b$, then $6a + 3b = \dots\dots\dots$

- a) 12 b) 9 c) 6 d) 3

(2) Which of the following is dispersion measure?

- a) Median b) Mean c) Mode d) range

(3) Which of the following relations represents directly variation between $X, Y \dots\dots\dots$

- a) $XY = 5$ b) $Y = X + 3$ c) $\frac{x}{3} = \frac{4}{y}$ d) $\frac{x}{5} = \frac{y}{2}$

[B] If $\frac{a}{3x+4y} = \frac{b}{5x-2y} = \frac{c}{y+2x}$, prove that:

$$13X(3c - 2a) + 5Y(a + 2b) = \text{Zero}$$

[Q3] [A] If $X = \{1, 2, 3, 6, 11\}$, and $\mathcal{R}$ is relations on X where $a \mathcal{R} b$ means $((a + 2b = \text{odd number}))$ for each $a \in X, b \in X$.

- ① Write $\mathcal{R}$ and represents it with arrow diagram
- ② Prove that $\mathcal{R}$ is a function. (Give reason)

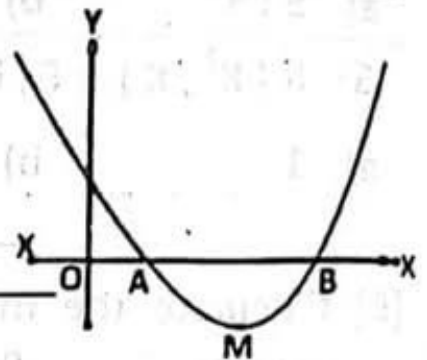
[B] IF a, b, c, d are in continued proportion, prove that:

$$\frac{a^2 + b^2 + c^2}{b^2 + c^2 + d^2} = \frac{a}{b} \cdot \frac{c}{d}$$

[Q4] [A] In the opposite figure:

The curve of quadratic function

Cut X-axis in $A(1, 0), B(4, 0)$, M is vertex of curve and $F(-2) + F(7) = 8$, Find $F(-2)$



[B] From the following table:

X	2	4	6	a	3
Y	6	3	2	$2\frac{2}{5}$	b

- ① Determine the type of variation between X, Y
- ② Find the value of a, b

[Q5] [A] Two positive real numbers, ratio between them is $4 : 7$, square of the smallest is more than five times the greatest by 29. Find the two numbers

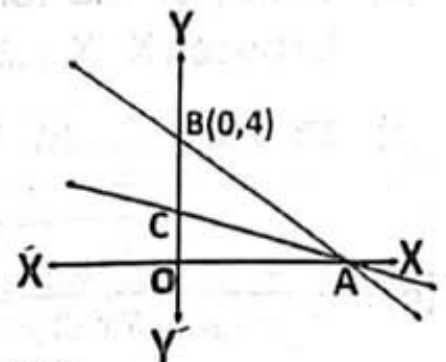
[B] In the opposite figure:

$\overrightarrow{AC}$ represents the linear function

$F(x) = 2 - \frac{2}{3}x$, $\overrightarrow{AB}$ represents

The linear function $G(x) = Kx + m$

IF point $B(0, 4)$. Find the value of K, M



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End of the questions

GEOMETRY – MODEL NO (1)**[Q1] A) Choose the correct answer:**

(1) The sum of the measures of the accumulative angles at a point
=^o

- a) 90 b) 180 c) 270 d) 360

(2) If the figure ABCD is a rhombus, where A (7 , 1) , B (1 , 9) ,
then the perimeter of rhombus = units

- a) 10 b) 14 c) 40 d) 100

(3) The quadrilateral in which its diagonals bisect each other and
perpendicular is called

- a) Trapezium b) Parallelogram c) Rectangle d) Rhombus

[B] By using the slope:

Prove that the points A (- 1 , - 3) , B (4 , 7) , C (1 , 1) are collinear.

[Q2] Choose the correct answer:

(1) If the figure ABCD is a parallelogram, then: $\sin \left(\frac{A+B}{4} \right) = \dots\dots$

- a) $\frac{1}{2}$ b) $\frac{\sqrt{2}}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\sqrt{2}$

(2) If $\overline{LN}$ is diameter in a circle its center M, where L (- 2 , 3) ,
N (6 , - 5) , then coordinates of point M are

- a) (2 , 1) b) (- 2 , - 1) c) (2 , - 1) d) (- 2 , 1)

(3) If 5 cm, 9 cm, X cm are sides lengths of a triangle, then X may
be equal

- a) 4 b) 10 c) 14 d) 18

**[B] If the distance between two points (X , 5) and (6 , 1)
equals $2\sqrt{5}$ length units, find the values of X.**

[Q3] [A] $\triangle XYZ$ is right at Y , $XY = 9$ cm, $XZ = 15$ cm

Find the value of: $\cos^2 Z - \cos^2 X$

[B] Find the measure of the positive angle which the straight line L makes with the positive direction of X -axis if the straight line L is parallel to the straight line: $X - Y = 3$

[Q4]

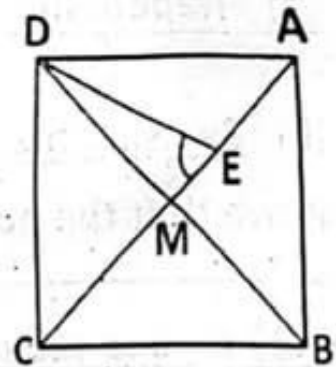
[A] If $\overline{AD}$ is a median in $\triangle ABC$, m is midpoint of $\overline{AD}$, if $m(-3, -2)$, $B(-2, 4)$, $C(0, 6)$. Find the coordinates of point A

[B] In the opposite figure:

$ABCD$ is square its diagonals intersect at M

$E \in \overline{AC}$, $CE = 5$ cm, $AE = 3$ cm

Find: $\tan(\angle DEC)$



[Q5]

[A] If $2 \cos X = \tan 60^\circ \tan 45^\circ$ where X is acute angle,

Find: $\tan 2X$

[B] In the opposite figure:

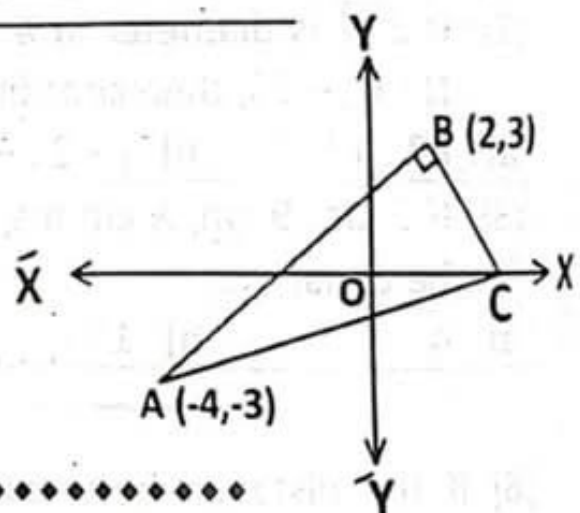
$A(-4, -3)$, $B(2, 3)$

And $\overline{AB} \perp \overline{BC}$

Find:

① The Coordinates of point C

② The equation of $\overline{AC}$



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End of the questions

GEOMETRY – MODEL No (2)

[Q1] A) Choose the correct answer:

- (1) The acute angle complements angle
a) Zero b) Acute c) Right d) Obtuse
- (2) The slope of straight line whose equation $Y = 3$ is
a) Zero b) 1 c) 3 d) Undefined
- (3) AB is a diameter in the circle M, where $M (2, -1)$, $A (-2, 3)$, then the coordinate of point B is
a) $(0, 1)$ b) $(0, 2)$ c) $(2, -2)$ d) $(6, -5)$

[B] if $A (3, 1)$, $B (1, 2)$, $C (5, 4)$. Prove that: $BC = 2 AB$

[Q2] Choose the correct answer:

- (1) The two perpendicular straight lines to third are
a) Parallel c) Intersecting
b) Perpendicular d) Intersecting on perpendicular
- (2) If the area of a square is 18 cm^2 , then the length of its diagonal equals cm
a) 3 b) $3\sqrt{2}$ c) 6 d) 9
- (3) In $\triangle ABC$ right at B, if $2 AB = \sqrt{3} AC$, then $m(\angle C) = \dots\dots^\circ$
a) 30 b) 45 c) 60 d) 75

[B] If the points $A (0, 1)$, $B (X, 3)$, $C (2, 5)$ are collinear, find the value of X?

[Q3] [A] If $\cos X = \sin 30^\circ \tan 45^\circ$ (Where X is an acute angle)

Find the value of: $\tan^2 X - \sin^2 (X - 15^\circ)$

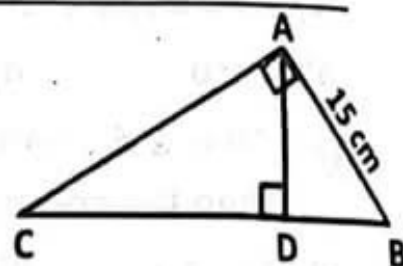
[B] In $\triangle ABC$, $A(2, 1)$, $B(2, 5)$, $C(3, 4)$ and D, E are midpoint of $\overline{AB}$, $\overline{AC}$. Find equation of $\overline{DE}$.

[Q4]

[A] In the opposite figure:

$\triangle ABC$ right at A, $\overline{AD} \perp \overline{BC}$, $AB = 15$ cm

$\tan(\angle BAD) = \frac{3}{4}$, Find the area of $\triangle ABC$



[B] If the straight line L_1 passes through $(3, 1)$, $(2, 2)$ and the straight line L_2 make with positive direction of X-axis a positive acute angle of measure E° , where $\sin E = \frac{1}{\sqrt{2}}$

Prove that: L_1, L_2 are perpendicular

[Q5] [A] The $\triangle ABC$ is an isosceles triangle where $AB = AC = 12.6$ cm, $m(\angle C) = 54^\circ 24'$, find to the nearest one decimal place the length of $\overline{BC}$.

[B] In the opposite figure:

$L_1 \parallel L_2$, where equation of $L_1: Y = 5 - X$,

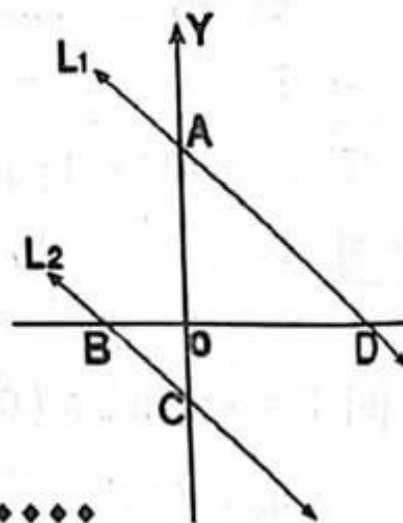
And L_1 cut the two axes at the points D, A

And L_2 cut the two axes at the points B, C

Where $AC = 7$ length units. Find:

1) Coordinate of points B, C

2) Equation of the straight line L_2



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End of the questions

GEOMETRY – MODEL NO (3)

[Q1] A) Choose the correct answer:

(1) The distant between two straight line $Y - 3 = 0$, $Y + 2 = 0$ is Length unit

- a) 1 b) 2 c) 3 d) 5

(2) The perimeter of triangle is bounded with lines $X = 0$, $Y = 0$, $4X + 3Y = 12$ equals Length unit

- a) 6 b) 12 c) 30 d) 60

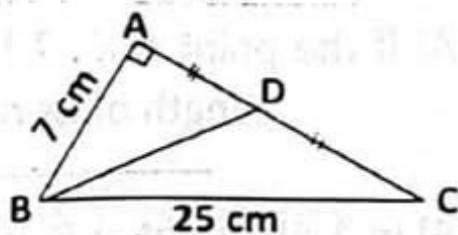
(3) If $\cos X = \frac{\sqrt{3}}{2}$ where $\frac{x}{2}$ acute angle , then $\sin 2X = \dots\dots\dots$

- a) 1 b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{1}{\sqrt{2}}$

[B] In the opposite figure:

$\overline{AB} \perp \overline{AC}$, $AB = 7$ cm , $BC = 25$ cm

$AD = DC$, Find: $\tan C + \frac{1}{\tan(\angle ABD)}$



[Q2] Choose the correct answer:

(1) The slope of straight line which make positive angle θ with the positive direction of X-axis is

- a) $\sin \theta$ b) $\cos \theta$ c) $\frac{\sin \theta}{\cos \theta}$ d) $\frac{\cos \theta}{\sin \theta}$

(2) In the opposite figure:

The value of $a = \dots\dots\dots$

- a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{\sqrt{3}}$
c) $\sqrt{2}$ d) $\sqrt{3}$



(3) The slope of straight line $3Y = Kx - 5$ and passes $(20, 5)$ is

- a) -1 b) 1 c) -2 d) $\frac{1}{3}$

[B] Find the equation of straight line passes through the point $(-1, -3)$ and perpendicular on the line passes through $(5, 6)$, $(3, 7)$

GEOMETRY – MODEL NO (4)

[Q1] A) Choose the correct answer:

(1) Straight line passing through $(3, 4)$ and parallel to Y-axis is.....□

- a) $X = 3$ b) $X = 4$ c) $Y = 3$ d) $Y = 4$

(2) A circle its center is origin point and its radius 2 units, which of the following points belong to the circle?

- a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

(3) In $\triangle ABC$, if $\tan A = 2 + \sqrt{3}$, $\tan B = 2 - \sqrt{3}$, then $m(\angle C) = \dots\dots^\circ$

- a) 60 b) 90 c) 100 d) 120

[B] $\triangle ABC$, $A(2, 1)$, $B(2, 5)$, $C(3, 4)$, D is midpoint of $\overline{AB}$, draw $\overline{DE} \parallel \overline{BC}$ and cut $\overline{AC}$ in E. Find equation of $\overline{DE}$

[Q2] Choose the correct answer:

(1) If the two lines $Y = aX + b$, $Y = CX + D$ are perpendicular, then
..... = -1

- a) $A \times D$ b) $A \times C$ c) $B \times C$ d) $B \times D$

(2) If $\sin X = 2 \sin 30^\circ \cos 60^\circ$, then $X = \dots\dots\dots^\circ$

- a) 30 b) 45 c) 60 d) 75

(3) The distant between $(2, 4)$ and straight line $Y + 2 = 0$ isunits

- a) 2 b) 4 c) 6 d) 8

[B] ABCD is a trapezium, $\overline{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$, $AB = 3 \text{ cm}$,
 $AD = 6 \text{ cm}$, $BC = 10 \text{ cm}$

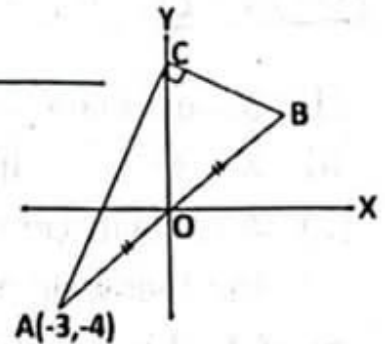
Prove that: $\cos(\angle DCB) - \tan(\angle ACB) = \frac{1}{2}$

[Q3]

- [A] If the points $A(0, 1)$, $B(X, 3)$, $C(2, 5)$ are collinear, find the value of X .

- [B] **In the opposite figure:**

If $C \in Y$ -axis, $A(-3, -4)$, $\overline{AC} \perp \overline{BC}$
Find the length of $\overline{BC}$

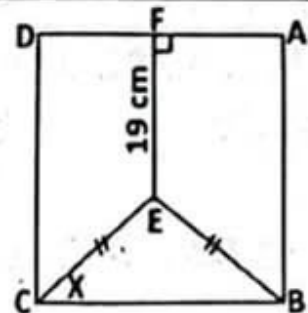
**[Q4]**

- [A] **In the opposite figure:**

$ABCD$ is a square of side length 24 cm

$\overline{EF} \perp \overline{AD}$, $FE = 19$ cm, $EB = EC$

$K(\cos X - \sin X) = 1$. Find value of K ?

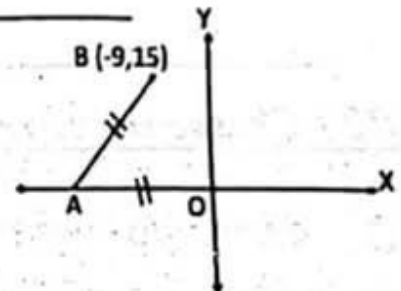


- [B] **In the opposite figure:**

$A \in X$ -axis, $AO = AB$, where O is origin point

$B(-9, 15)$.

Find the length of $\overline{AB}$

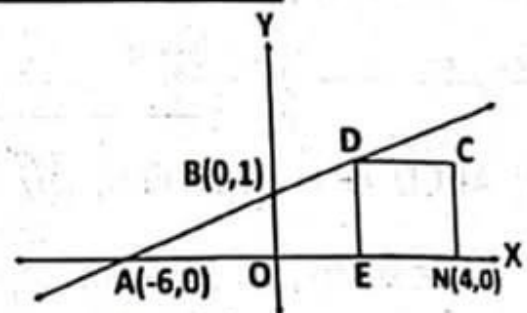
**[Q5]**

- [A] If X is an acute angle, $\cos X \tan X = \frac{1}{2}$, find value of: $1 + \cos 2X$

- [B] **In the opposite figure:**

$A(-6, 0)$, $B(0, 1)$, $N(4, 0)$

$DENC$ is a square. Find its area?



.....

End of the questions

GEOMETRY – MODEL NO (5)**[Q1] A) Choose the correct answer:**(1) The slopes of two parallel lines are $-\frac{2}{3}$, $\frac{K}{2}$, then $K = \dots$

- a) $-\frac{3}{4}$ b) $\frac{1}{3}$ c) 3 d) $-\frac{4}{3}$

(2) If $\tan (X + 10)^\circ = \sqrt{3}$, where $(X+10)$ is acute angle, then $X = \dots$

- a) 20 b) 40 c) 50 d) 70

(3) The area of triangle is bounded with lines $3X - 4Y = 12$, $X = 0$, $Y = 0$ equals square units

- a) 6 b) 7 c) 12 d) 15

[B] Find the equation of straight line passing through $(-1, 3)$, its slope is positive and cut two equal parts from two coordinate axes

[Q2] Choose the correct answer:(1) ABCD is a rhombus, $A(3,3)$, $C(-3,-3)$ then slope of $\overline{DB} = \dots$

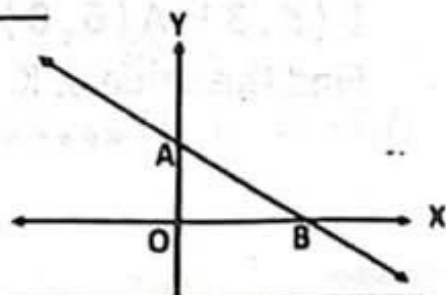
- a) -1 b) 1 c) $\frac{1}{3}$ d) $-\frac{1}{3}$

(2) If the $\triangle ABC$ is right at B, area of $\triangle ABC = \frac{1}{2} (BC)^2$, then $\tan A =$

- a) 1 b) $\sqrt{3}$ c) $\frac{1}{\sqrt{3}}$ d) $\frac{1}{2}$

(3) The equation of straight line parallel to X-axis and passing through $(5, 3)$ is

- a) $X = 3$ b) $X = 5$ c) $Y = 3$ d) $Y = 5$

[B] In the opposite figure: $A(0, 6)$, area of $\triangle OAB = 9$ square unitsFind equation of $\overline{AB}$ 

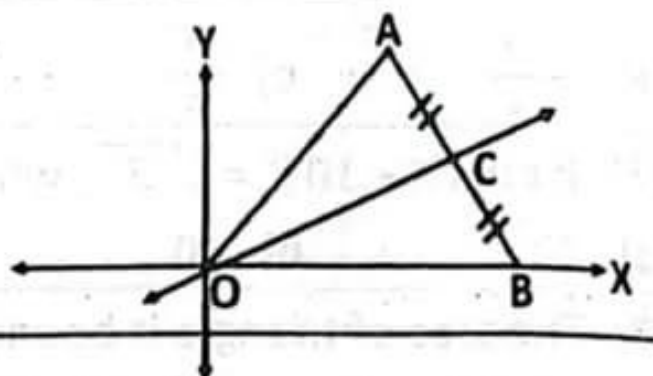
[A] Find the value of X :

$$X \sin 45 \cos 45 \tan 60 = \tan^2 45 - \cos^2 60$$

[B] In the opposite figure:

C is midpoint of $\overline{AB}$

Find equation of $\overrightarrow{OC}$? $\square$

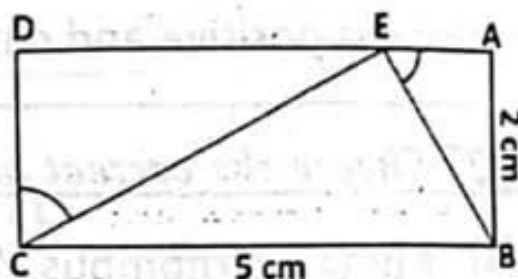


[A] Prove that two lines: $4X + 3Y = 12$, $8X + 6Y = 48$ are parallel, then find distance between them

[B] In the opposite figure:

$$m(\angle AEB) = m(\angle DCE)$$

AB = 2 cm, BC = 5 cm. Find $\tan (\angle AEB)$



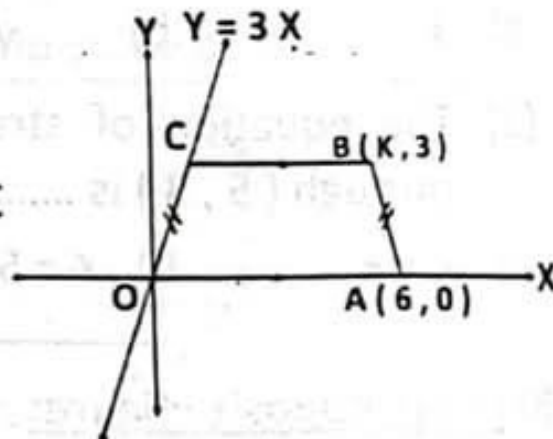
[A] If ΔABC is right at B, $\tan A + \tan C = \frac{25}{12}$, Find: $\tan^2 A + \tan^2 C$

[B]. In the opposite figure:

$\overline{AO} \parallel \overline{BC}$, Equation of $\overline{OC}$ is $Y = 3X$

$$B(K, 3), A(6, 0)$$

Find the value of K.



End of the questions

GEOMETRY — MODEL NO (6)

[Q1] A) Choose the correct answer:

(1) If two lines: $3X - 4Y - 3 = 0$, $KY + 4X - 8 = 0$ are perpendicular, then the value of $K = \dots\dots\dots$

- a) -4 b) -3 c) 3 d) 4

(2) In $\triangle DEF$ right at E , which of the following is false?

- a) $\tan D \times \tan F = 1$ c) $\sin D = \cos F$
b) $\cos D = \sin F$ d) $\cos D = \sin E$

(3) If $\tan X = 2$, x is an acute angle, then $\sin X \cos X = \dots\dots\dots$

- a) 3 b) $\frac{1}{2}$ c) $\frac{1}{5}$ d) $\frac{2}{5}$

[B] Find the equation of straight line whose slope $\frac{2}{3}$ and passing through point $(3, -1)$

[Q2] Choose the correct answer:

(1) The straight line whose equation $3X + 4Y = 9$ is parallel to lines whose slope is $\dots\dots\dots$

- a) $\frac{3}{4}$ b) $\frac{4}{3}$ c) $\frac{1}{5}$ d) $\frac{2}{5}$

(2) $\overline{AB}$ is a diameter in circle M , $A(-2,3)$, $B(6,-5)$, then M is $\dots\dots\dots$

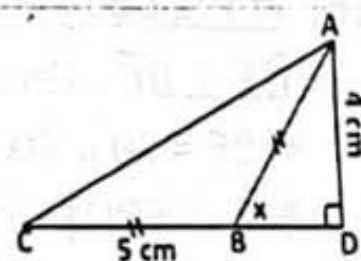
- a) $(4, 4)$ b) $(-2, 1)$ c) $(2, -1)$ d) $(-1, 2)$

(3) In the opposite figure:

$AD \perp DC$, $AB = BC = 5$ cm

$AD = 4$ cm, $m(\angle ABD) = X$, then $\tan \frac{x}{2} = \dots$

- a) $\frac{4}{5}$ b) $\frac{1}{2}$ c) $\frac{5}{4}$ d) 2



[B] If Axis of symmetry of CD passing through $A(6,m)$, $C(3,1)$, $D(-3,7)$ find the value of m

[A] In the opposite figure:

A rectangle $ABCD$ is shown with vertices A (bottom-left), B (bottom-right), C (top-right), and D (top-left). The side AD is labeled 4 cm and the side DC is labeled 9 cm . Point E is located on side DC such that $DE = 4\text{ cm}$. Point F is located on side AB such that $AF = 4\text{ cm}$. Line segments AC and EF are drawn, intersecting at point G . Right angle symbols are shown at E and F .

[B] In the opposite figure:

[A] Without using calculator find the value of X:

$$\cos X = \frac{\sin 60 \sin 30}{\tan 45 \sin 45}$$

[B] ABCD is a rectangle, A(1 , 1) , B (3 , 3) c (0 , - 3 X , D (X , Y). find the value of X , Y

[A] ABC is a triangle right at B, prove that: $\sin^2 A + \cos^2 A = 1$

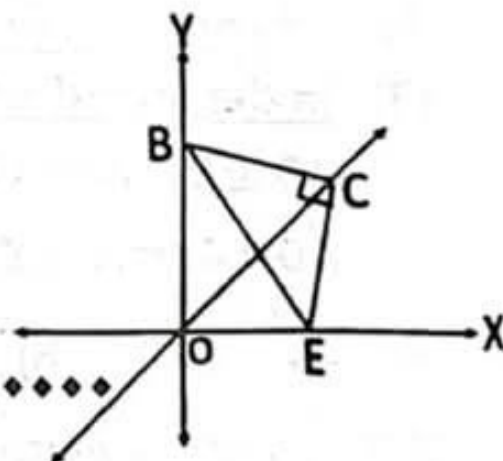
[B] In the opposite figure:

$\overline{CE} \perp \overline{BC}$, Equation of $\overline{(OC)}$ is $4X - 3Y = 0$

If BE = 20 units

$$m(\angle EOC) = m(\angle CBE)$$

Find length of $\overline{BC}$



End of the questions

GEOMETRY – MODEL No (7)

[Q1] A) Choose the correct answer:

(1) If point $(K, 2K)$ lies on straight line $2X + Y = 8$, then $K = \dots\dots\dots$

- a) -2 b) 1 c) 2 d) 3

(2) If $\sin 2X = \frac{\sqrt{3}}{2}$, $2X$ is acute angle, then $X = \dots\dots\dots^\circ$

- a) 20 b) 30 c) 45 d) 60

(3) The distance between two lines $X + 3 = 0$, $X - 2 = 0$ equals.....

- a) 3 b) 4 c) 5 d) 6

[B] If the point $(5, 2)$ is midpoint of $\overline{AB}$, $A(x, 7)$, $B(-4, y)$
Find $X + Y$

[Q2] Choose the correct answer:

(1) In $\triangle ABC$, if $m(\angle A) : m(\angle B) : m(\angle C) = 3 : 4 : 5$

Then $\cos B = \dots\dots\dots$

- a) Zero b) $\frac{1}{2}$ c) 1 d) $\frac{\sqrt{3}}{2}$

(2) The equation of straight line passing through $(-2, K)$ and parallel to X-axis is

- a) $X = -2$ b) $Y = -2$ c) $X = K$ d) $Y = K$

(3) The straight line which passes through $(-1, -1)$, $(4, 4)$, make a positive angle with positive direction of X-axis of measure

- a) 30 b) 45 c) 60 d) 135

[B] $\triangle ABC$, $A(3, 2)$, $B(4, -5)$, $C(0, -2)$, $\overline{AD}$ is a median.

Find equation of $\overline{AD}$

[03]

[A] Find the value of X : $X \sin^2 45 = \sin 30 \cos 60 + \cos 30 \sin 60$

[B] Prove that the points $A(5, 3)$, $B(3, -2)$, $C(-2, -4)$ are vertices of an obtuse triangle at B , then find coordinate of point D which make the figure $ABCD$ is a rhombus and its area?

[04]

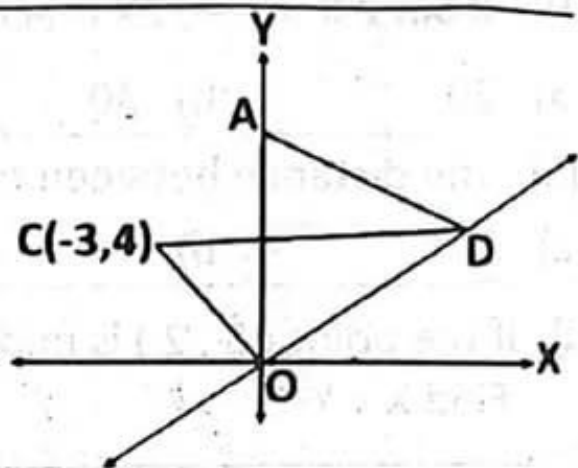
[A] **In the opposite figure:**

Equation of $\overrightarrow{OC}$ is $Y = 2X$, $C(-3, 4)$

If the area of $\triangle AOD = \text{area of } \triangle COD$

① Find coordinate of point A .

② Find equation of $\overrightarrow{AC}$

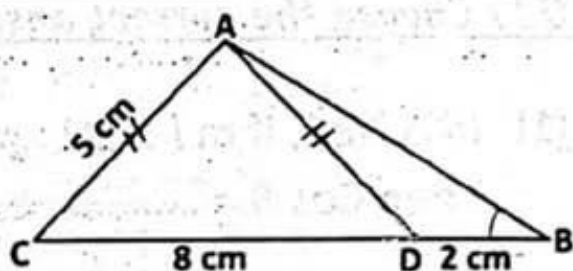


[B] **In the opposite figure:**

$\triangle ABC$, $D \in AC$, $AD = AC = 5$ cm,

$BD = 2$ cm, $CD = 8$ cm

Find: $\sin^2 B + \cos^2 C$

**[05]**

[A] $\triangle ABC$ is right at B , $2AB = \sqrt{3} AC$, find:

① Trigonometric ratio of $\angle C$

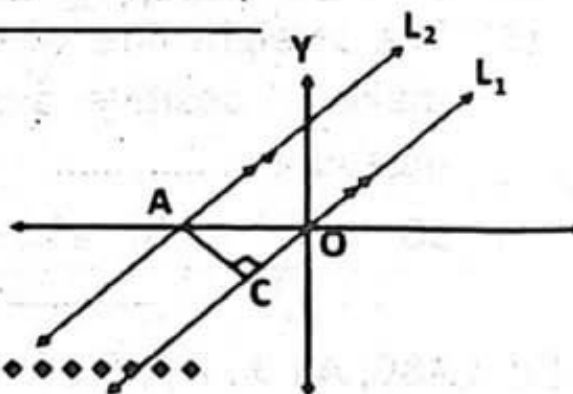
② $m(\angle A)$

[B] **In the opposite figure:**

Equation of L_1 is $Y = X$.

$L_1 \parallel L_2$, $AC \perp L_1$, $AC = 3\sqrt{2}$ units

Find the equation of L_2



.....

End of the questions

GEOMETRY – MODEL NO (8)

[Q1] A) Choose the correct answer:

(1) The distant between $(L, -4)$ and Y-axis is units, $L \in \mathbb{R}$

- a) 4 b) L c) -4 d) $|L|$

(2) If $\sin X = 2 \cos 60 \sin 30$, X is an acute angle, then $X = \dots\dots\dots$

- a) 30 b) 60 c) 45 d) 75

(3) If the two lines $3X - 4Y - 3 = 0$, $3X + KY - 8 = 0$ are perpendicular, then $K = \dots\dots\dots$

- a) -4 b) -3 c) 3 d) 4

[B] ABCD is a rhombus, $A(1, 3)$, $C(7, 9)$. Find equation of $\overline{BD}$

[Q2] Choose the correct answer:

(1) A circle its center is origin point, its radius is 2 units, which of the following points lies on the circle?

- a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

(2) $\triangle ABC$ is right at B, $3AC = 5BC$, then $\tan A = \dots\dots\dots$

- a) $\frac{3}{5}$ b) $\frac{5}{3}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$

(3) The equation $2X - 3Y - 6 = 0$ cut from Y-axis part ofunits

- a) -6 b) -2 c) $\frac{2}{3}$ d) 2

[B] ABCD is an isosceles trapezium, $\overline{AD} \parallel \overline{BC}$, $AD = 4 \text{ cm}$, $AB = 5 \text{ cm}$, $BC = 12 \text{ cm}$

Prove that: $\frac{5 \tan B \cos C}{\sin^2 C + \cos^2 B} = 3$

GEOMETRY – MODEL No (9)**[Q1] A) Choose the correct answer:**(1) If $m(\angle A) = 75$, $\sin B = \cos B$, B acute angle, then $m(\angle C) = \dots^\circ$

- a) 45 b) 60 c) 75 d) 120

(2) If $\triangle ABC$ is an isosceles triangle right at C, then $\tan A = \dots$

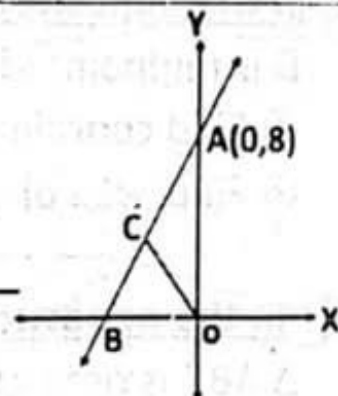
- a) $\frac{1}{3}$ b) $\sqrt{3}$ c) 1 d) -1

(3) If $\overline{AB} \perp \overline{CD}$, slope of $\overline{AB} = \text{zero}$, then slope of $\overline{CD}$ is

- a) 1 b) -1 c) Zero d) Undefined

[B] In the opposite figure:

O is origin point, A (0,8),

Area of $\triangle AOC = 4$ square units,If $AB = 3 AC$, find equation of AB**[Q2] Choose the correct answer:**(1) If $\cos 3X = \frac{1}{2}$, $3X$ is an acute angle, then $X = \dots^\circ$

- a) 20 b) 30 c) 45 d) 60

(2) The length of radius of the circle of center (0, 0) and passes through (3, 4) equals Units

- a) 7 b) 1 c) 12 d) 5

(3) The measure of exterior angle of an equilateral triangle = $\dots^\circ$

- a) 60 b) 90 c) 120 d) 80

[B] Without using calculator find the value of X:

$$2 \sin X = \tan^2 60 - 2 \tan 45$$

[03]

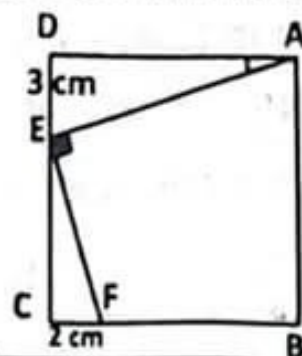
- [A] ABCD is a quadrilateral, $A(0, 6)$, $B(-1, 3)$, $C(5, 1)$, $D(6, 4)$
 prove by using the slope that ABCD is a rectangle and find its area

[B] **In the opposite figure:**

ABCD is a square, $E \in \overline{DC}$, $F \in \overline{BC}$

If $DE = 3 \text{ cm}$, $FC = 2 \text{ cm}$

Find $\tan(\angle DAE)$.

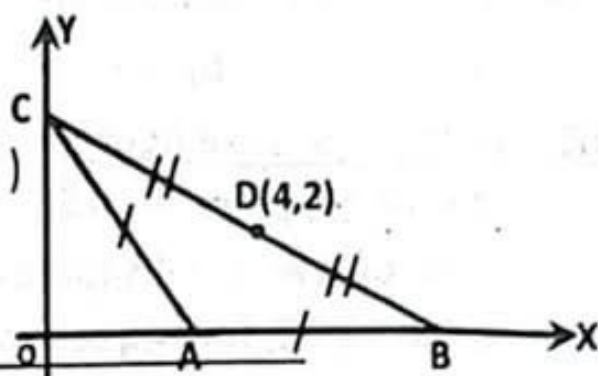
**[04]**

[A] **In the opposite figure:**

D is midpoint of $\overline{BC}$, $AB = AC$, $D(4, 2)$

① Find coordinate of A

② Find area of $\triangle ABC$



[B] **In the opposite figure:**

$\triangle ABC$ is right at B, $7 \tan A - 24 = 0$. Find the value of:

$$1 - \tan A \sin C$$

[05]

- [A] If the point $A(3, X)$, $B(4, 1)$, $C(5, 3)$ are collinear.

Find the value of X

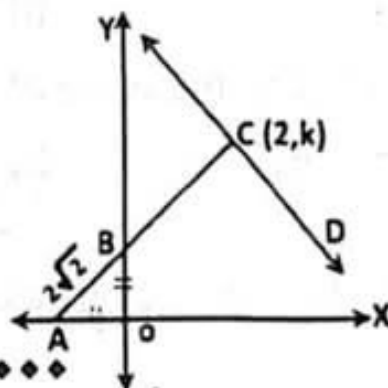
[B] **In the opposite figure:**

O is an origin point, $OA = OB$

$AB = 2$ units, $C(2, k)$

$\overline{AB} \perp \overline{CD}$. ① Find the value of K

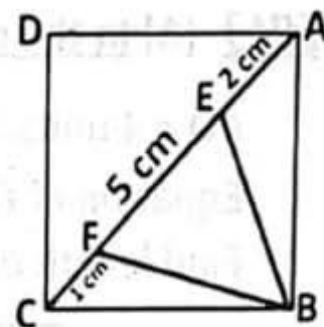
② Find the equation of $\overline{CD}$



.....
End of the questions

GEOMETRY – MODEL NO (10)**[Q1] A) Choose the correct answer:**

- (1) If $m(\angle C) = 85$, $\sin B = \cos B$, B acute angle, then $m(\angle A) = \dots^\circ$
 a) 30 b) 45 c) 50 d) 60
- (2) Area of triangle whose is bounded with straight lines $X=0$, $Y=0$, $3X+2Y=12$ issquare units
 a) 6 b) 12 c) 4 d) 5
- (3) The slope of straight line passing through $(1, Y)$, $(3, 4)$ equal $\tan 45$, then $Y = \dots$
 a) 1 b) 2 c) -1 d) 4

[B] In the opposite figure:ABCD is a square, $E, F \in \overline{AC}$, $AE = 2$ cm, $CF = 1$ cm, $EF = 5$ cmFind the value of: $\tan(\angle BEF) + \tan(\angle BFE)$ **[Q2] Choose the correct answer:** ☐

- (1) The straight line $aX + (2 - a)Y = 5$ is parallel to straight line whose passing through $(1, 4)$, $(3, 5)$, then the value of $a = \dots$
 a) 3 b) -2 c) 6 d) 4
- (2) $\triangle ABC$, $2m(\angle C) = m(\angle A) + m(\angle B)$, then $m(\angle C) = \dots$
 a) 30 b) 60 c) 45 d) 90
- (3) The straight line $\frac{x}{2} - \frac{y}{3} = 6$ cut from X -axis part = Units
 a) 3 b) 2 c) 6 d) 12

[B] $\overline{AB}$ is diameter in circle M , $B(8, 11)$, $M(5, 7)$ Find:

① Circumference of circle

② Equation of perpendicular straight line on $\overline{AB}$ at A

حمل الآن

مجانا وحصريا

امتحانات رقم (4)

الترم الاول



نموذج استرشادي لامتحان إتمام الدراسة بمرحلة التعليم الأساسي

الفصل الدراسي الأول ٢٠٢٥/٢٠٢٦ م

المادة: الجبر والإحصاء باللغة الانجليزية

التاريخ: / / ٢٠٢٦ م

عدد صفحات الأسئلة (٦) صفحات

+ مسودة بخلاف الغلاف

و على الطالب مسئولية المراجعة

و التأكد من ذلك قبل تسليم الكراسة

مجموع الدرجات

رقم المراقبة

رقم السؤال	الدرجة رقما	الدرجة كتابة	التوقيع	
			المقدر	المراجع
من ٩ إلى ٩				
من ١٠ إلى ١١				
من ١٢ إلى ١٣				
من ١٤ إلى ١٥				
١٦				
المجموع				

نموذج استرشادي امتحان إتمام الدراسة بمرحلة التعليم الأساسي

الفصل الدراسي الأول ٢٠٢٥/٢٠٢٦ م

المادة: الجبر والإحصاء باللغة الانجليزية

التاريخ: / / ٢٠٢٥ م

زمن الإجابة: ساعتان

رقم المراقبة

عدد صفحات الأسئلة (٦) صفحات

+ مسودة بخلاف الغلاف

و على الطالب مسئولية المراجعة

و التأكد من ذلك قبل تسليم الكراسة

الإدارة التعليمية :

اسم الطالب رابعيا :

المدرسة :

رقم الجلوس :

توقيع الملاحظين : ١

2

توقيع الملاحظين بصحة بيانات الطالب

كما وردت رقم جلوس الطالب

و مطابقة عدد أوراق كراسة الإجابة عند

استلامها من الطالب

Group(1) : Choose the correct answer from those given:

1 The cubic root of the rational number a is the number whose cube equals

(a) a

(b) a^2

(c) a^3

(d) $3a$

2 The value of the ratio doesn't change if its terms are multiplied by a real number doesn't equal

(a) -1

(b) zero

(c) 1

(d) 2

3 The most common and accurate measure of dispersion is the

(a) standard deviation

(b) arithmetic mean

(c) mode

(d) median

4 If $(x - y) = 5$ and $x^2 - y^2 = 20$, then $(x + y) =$

(a) 100

(b) 25

(c) 15

(d) 4

بقية الأسئلة في الصفحات التالية

- 5 If $n(X^2) = 9$ and $n(Y) = 2$, then $n(X \times Y) = \dots\dots\dots$
 (a) 4 (b) 6 (c) 11 (d) 18
- 6 The point (3,7) lies on the straight line which represents the function $f : f(x) = \dots\dots$
 (a) 3 (b) 4 (c) 7 (d) 12
- 7 The number which is added to the two terms of the ratio 7 : 11 to becomes 2 : 3 is
 (a) 4 (b) 3 (c) 2 (d) 1
- 8 If $X = \{3, 5\}$ and $Y = \{6, 7\}$, then $(3, 5) \in \dots\dots\dots$
 (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2
- 9 If $f : R \rightarrow R$ where $f(x) = x - k$, $f(8) = 5$, then $k = \dots\dots\dots$
 (a) -1 (b) 1 (c) 2 (d) 3

بقية الأسئلة في الصفحات التالية

Group (2) : Answer the following questions showing the steps of solution :-

(10) If y varies directly as x and $x=7$ when $y=21$, Find :

First : the relation between y and x

Second : the value of x when $y = 60$

(11) If a, b, c and d are proportional quantities ,

Prove that $\frac{2a+b}{b} = \frac{2c+d}{d}$

بقية الأسئلة في الصفحات التالية

(12) If $X = \{ 2, 4, 6 \}$ and R is a function on X ,

where $R = \{ (2, 4), (a, 6), (b, 4) \}$, find

First : the range of the function R

Second : the numerical value of $a + 2b$ (where $a < b$)

(13) If 2 is the positive middle proportional between $k + 1$ and 1 ,
find the value of k

بقية الأسئلة في الصفحات التالية

(14) If $\frac{x+y}{x+2y} = \frac{3}{4}$, Find the value of $\frac{x}{y}$

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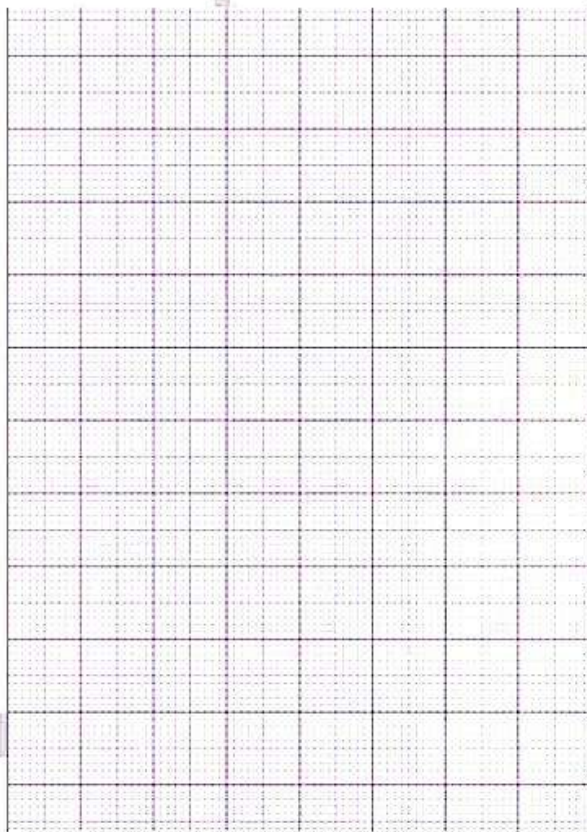
.....

(15) Graph the curve of the function $f : f(x) = 4 - x^2$, where $x \in [-2, 2]$

from the graph find

First: the coordinates of the vertex

Second : the maximum value of the function



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بقية الأسئلة في الصفحات التالية

(16) Calculate the arithmetic mean and the standard deviation for
the values : 2 , 3 , 5 , 7 , 8

(انتهت الأسئلة مع خالص الدعاء بالتوفيق)

مديرية التربية والتعليم
Directorate Of Education In Cairo



نموذج استرشادي لامتحان إتمام الدراسة بمرحلة التعليم الأساسي

الفصل الدراسي الأول ٢٠٢٥/٢٠٢٦ م

المادة : الهندسة وحساب المثلثات بالانجليزية

التاريخ : / / ٢٠٢٦ م

عدد صفحات الأسئلة (٦) صفحات

+ مسودة بخلاف الغلاف

و على الطالب مسئولية المراجعة

و التأكد من ذلك قبل تسليم الكراسة

مجموع الدرجات

رقم المراقبة

رقم السؤال	الدرجة رقما	الدرجة كتابة	التوقيع	
			المقدر	المراجع
من ٩ إلى ٩				
من ١٠ إلى ١١				
من ١٢ إلى ١٣				
من ١٤ إلى ١٥				
١٦				
المجموع				

نموذج استرشادي لامتحان إتمام الدراسة بمرحلة التعليم الأساسي

الفصل الدراسي الأول ٢٠٢٥/٢٠٢٦ م

المادة : الهندسة التحليلية وحساب المثلثات بالانجليزية

التاريخ : / / ٢٠٢٦ م

زمن الإجابة : ساعة

رقم المراقبة

عدد صفحات الأسئلة (٦) صفحات

+ مسودة بخلاف الغلاف

و على الطالب مسئولية المراجعة

و التأكد من ذلك قبل تسليم الكراسة

الإدارة التعليمية :

اسم الطالب رابعيا :

المدرسة :

رقم الجلوس :

توقيع الملاحظين :

توقيع الملاحظين بصحة بيانات الطالب

كما وردت رقم جلوس الطالب

و مطابقة عدد أوراق كراسة الإجابة عند

استلامها من الطالب

١ -

٢ -

Question (1): Choose the correct answer from those given:

- 1 The sum of lengths of two sides of a triangle.....the length of the third side
(a) smaller than or equal (b) greater than or equal
(c) greater than (d) smaller than
- 2 $\tan 45^\circ = \dots\dots\dots$
(a) 1 (b) $\sqrt{3}$ (c) zero (d) -1
- 3 The slope of the straight line that makes an angle of measure θ with the positive direction of the X-axis equals
(a) $\sin\theta$ (b) $\cos\theta$ (c) $-\sin\theta$ (d) $\tan\theta$
- 4 $\sqrt{3} \tan 60^\circ = \dots\dots\dots$
(a) 1 (b) $\sqrt{3}$ (c) 3 (d) $2\sqrt{3}$

بقية الأسئلة في الصفحات التالية

- 5 If A(3 , 6) and B(2 , 5), then AB = length unit
 (a) $\sqrt{2}$ (b) 1 (c) 2 (d) $\sqrt{5}$
- 6 The perimeter of the rectangle whose dimensions are 8 cm, 6 cm equals cm
 (a) 48 (b) 28 (c) 24 (d) 14
- 7 If $2 \sin \theta = 1$ where θ is the measure of an acute angle, then $\theta = \dots\dots^\circ$
 (a) 60 (b) 55 (c) 30 (d) 45
- 8 The slope of the straight line that parallel to the straight line passes through the two points (4, 6) , (3, 8) equals
 (a) 2 (b) zero (c) $-\frac{1}{2}$ (d) -2
- 9 If ABC is a right-angled triangle at B where $m(\angle A) = 30^\circ$, then $\cos C = \dots\dots$
 (a) $\frac{\sqrt{3}}{2}$ (b) $\sqrt{3}$ (c) 1 (d) $\frac{1}{2}$

بقية الأسئلة في الصفحات التالية

Group (2): Answer the following questions showing the steps of solution :-

(10) Find the equation of the straight line whose slope equals -3 and intercepted a positive part of length 7 units from the Y-axis.

(11) Prove that the straight line which makes an angle of measure 45° with the positive direction of the X-axis is perpendicular to the straight line whose equation: $y = 5 - x$

بقية الأسئلة في الصفحات التالية

(12) Find the equation of the straight line that passes through the point (3 , 5) and its slope equals 2

(13) ABC is a right-angled triangle at C in which $AB = 10$ cm, $BC = 8$ cm

Find : First: the length of $\overline{AC}$

Second: the value of $1 + \tan^2 A$

بقية الأسئلة في الصفحات التالية

(14) ABCD is a rectangle where A(1 , 7) , B(1 , 1) and C(5 , 1) , find:

First: the point of intersection of its diagonals

Second: the coordinates of the point D

(15) Prove that: $\sin 60^\circ = 3 + 2\sin 30^\circ \cos 30^\circ - \tan^2 60^\circ$

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بقية الأسئلة في الصفحات التالية

(16) Prove that the points A(0 , 0) , B(4 , 3) and C(7 , -1) are the vertices of a right-angled triangle at B

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(انتهت الأسئلة مع خالص الدعاء بالتوفيق)

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6